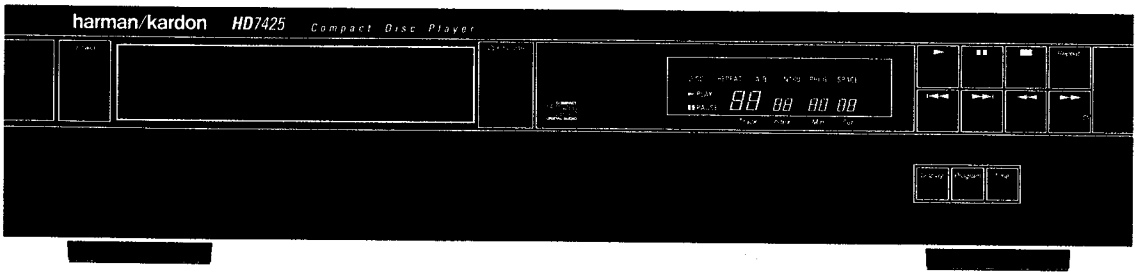
The Harman Kardon Model HD7425

Manual 193A

COMPACT DISC PLAYER

Technical Manual



The following marks found in the parts list of this manual identify the models as follows:

- BK : North America area model Black version
- IB : International model Black version
- I : International model

CONTENTS

SPECIFICATIONS 2
SAFETY PRECAUTIONS 3
CONTROLS AND FUNCTIONS 5
DISASSEMBLY PROCEDURES 7
POWER CORD REPLACEMENT 7
ADJUSTMENT PROCEDURE 8
TROUBLE SHOOTING 10
IC TERMINAL FUNCTIONS 14
CIRCUIT DESCRIPTION 19
IC BLOCK DIAGRAMS 23
CD MECHANISM EXPLODED VIEW 27
CD MECHANISM PARTS LIST 27
GENERAL UNIT EXPLODED VIEW 28
GENERAL UNIT PARTS LIST 29
P.C. BOARDS 30
WIRING DIAGRAM 31
ELECTRICAL PARTS LIST 32
SCHEMATIC DIAGRAM 36

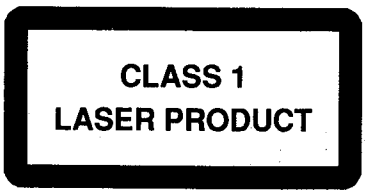
harman/kardon

Parts and Service Office
80 Crossways Park West, Woodbury, N.Y. 11797
1112-0570A152 A9403 1500 Printed in Japan

CLASS 1 LASER PRODUCT
Product complies with DHHS rules CFR subchapter J part 1040: 10 at date of manufacture.

DANGER—invisible laser radiation when opened and interlock failed or defeated. Avoid direct exposure to the beam.

CAUTION—use of all controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



Be Careful of the Laser Pickup
Although you cannot see it from the outside, a laser pickup is located under the disc tray and a precision lens is built in it.
Since the laser pickup, including the lens element, is especially sensitive to dust, keep the disc tray closed when not in use. Also do not put your hand inside the unit.

ADVARSEL:
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

VAROITUS!
Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilyä.

SPECIFICATIONS

System	: Compact Disc Digital Audio
D/A Converter	: Dual 18 Bit Linear D/A Converters, 4FS Digital Filter, RLS (Real-time Linear Smoothing)
Signal Detection	: 3-Beam Semiconductor Optical Laser Pickup
Error Correction	: CIRC System
Low Level Linearity	: +/−1.0dB @-90dB
Frequency Response	: 4Hz to 20kHz +0dB/−1.5dB
Total Harmonic Distortion (THD)	: 0.006%
Dynamic Range	: 95dB
Signal to Noise Ratio	: 100dB
Channel Separation	: 95dB
Line Output Level/Impedance	: 2.2V@10kΩ
Digital Output Level/Impedance (Coaxial)	: 0.5Vp-p @75Ω
Power Supply	
U.S.A. and Canada models	: AC120V, 60Hz
International model	: AC230/240V, 50/60Hz
Power Consumption	: 20Watts
Dimensions (W × H × D)	: 17-3/8" × 3-5/8" × 13" 442mm × 92mm × 326mm
Weight	: 10.4lbs./4.7kg

Specifications and components subject to change without notice.
Overall performance will be maintained or improved.

SAFETY PRECAUTIONS

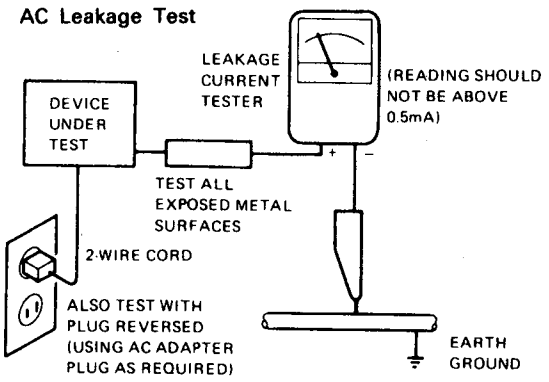
Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

a. Be sure that no built-in protective devices are defective and/or have been defeated during servicing.
   (1) Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience.
   (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks.
   Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, both are not limited to excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back over.

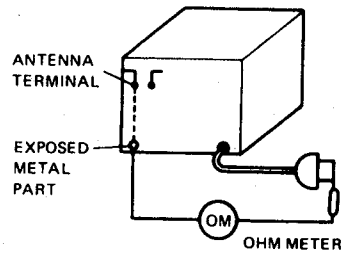
c. **Leakage Current Hot Check** — With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 "Leakage Current for Appliances" and Underwriters Laboratories (UL) 1270, (34.6). With the instrument AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat test. **ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER.**

AC Leakage Test



d. **Insulation Resistance Test**
   (1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug.
   (2) Turn on the power switch of the instrument.
   (3) Measure the resistance with an ohmmeter between the jumpered AC plug and each **exposed metallic** cabinet part on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. The reading should be as shown below. If it is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repaired and rechecked before it is returned to the customer.

e. **Insulation Resistance Test Cold Check**
   (1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug.
   (2) Turn on the power switch of the instrument.
   (3) Measure the resistance with an ohmmeter between the jumpered AC plug and each **exposed metallic** cabinet part on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 Megohm. When there is no return path to the chassis, the reading must be "infinite". If it is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repaired and rechecked before it is returned to the customer.



PRODUCT SAFETY NOTICE

Some electrical and mechanical parts have special safety related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, by (⚠) on schematics and parts listed. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. Products Safety is under review continuously and new instructions are issued whenever appropriate.

SERVICING PRECAUTIONS

CAUTION: Before servicing instruments covered by this manual and its supplements, read and follow the SAFETY PRECAUTIONS on this page.

NOTE: If unforeseen circumstances created conflict between the following servicing precautions and any of the safety precautions, **always follow the safety precautions.**

Remember: Safety First.

General Servicing Precautions

a. Always unplug the instrument AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other instrument assembly.
   (2) Disconnecting or reconnecting any instrument slectrical plug or other electrical connection.
   (3) Connecting a test substitute in parallel with an electrolytic capacitor in the instrument.
   Caution: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

b. Do **not** defeat any plug/socket B+ voltage interlocks with which instruments covered by this manual might be equipped.

c. Do **not** apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

NOTE: Refer to Safety Precautions on page 3.

(1) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.

(2) The Components used in the unit has a specified conflammability and dielectric strength. When replacing any components, use components which has the same ratings. Components marked (⚠) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace with the appointed components.

(3) An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install them as they were.

(4) After servicing, always check that the removed screws, components and wiring have been installed correctly and that the portion around the service part have not been damaged and so on. Further check the insulation between the blades of attachment plug and accessible conductive parts.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between the each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.

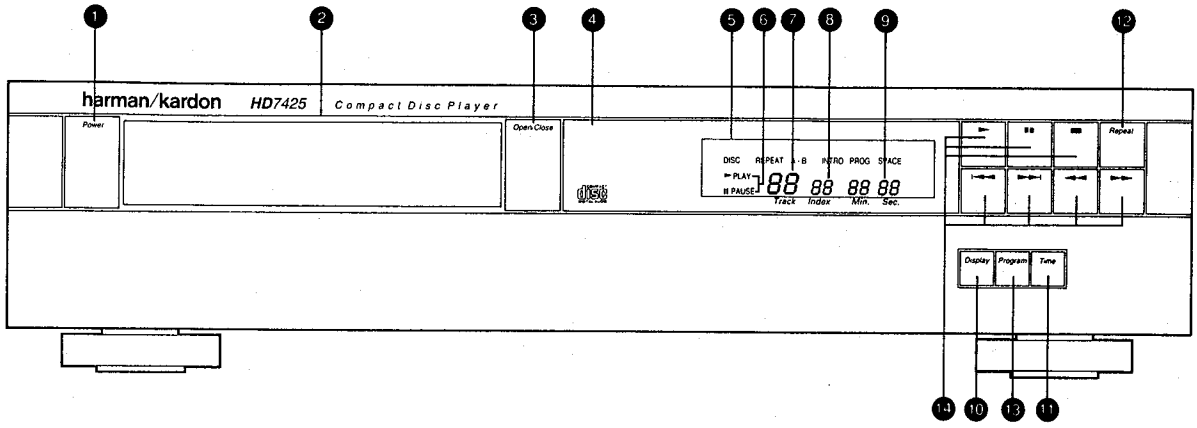
Note 1: Accessible Conductive Parts including Metal panels, Output jacks, etc.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some fieldeffect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damege caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

CONTROLS AND FUNCTIONS



❶ POWER switch
The POWER switch turns the unit on and off.

❷ Compact disc drawer
Load a disc (full-size or 3-inch/8 cm) into your compact disc player by placing it in this drawer with the label side up. Open and close the drawer using the OPEN/CLOSE button (3).

❸ OPEN/CLOSE button
Press this button to open or close the compact disc drawer. The drawer will also close if you press the play button or push the drawer gently toward the chassis of the player; however, we recommend that you do not push the drawer.

❹ REMOTE SENSOR
This area receives the signal from the remote control unit. Make sure this area of the front panel is kept free from dirt or other obstructions that might prevent proper reception of the infrared signal from the remote control.

❺ FUNCTION indicator
DISC - This indicator lights when the disc drawer is open, and when a disc is loaded. It does not light when there is no disc.
REPEAT - When this indicator is lit, the unit is in REPEAT mode and will continuously repeat either the entire disc or the programmed sequence.
A-B - When this indicator is lit steadily, the unit is set to repeat a specified section of the disc (from A to B). When REPEAT indicator is lit, you have already programmed the starting point (point A) of a section, and the unit is waiting for you to program the ending point of the section (point B).
INTRO - When this indicator is lit, the unit is in INTRO SCAN mode and will play only the first 15 seconds of each selection on the disc or in the selected program.
PROG - When this indicator is lit, the unit is in PROGRAM mode, in which you can program a sequence of tracks in the order you'd like to hear them, then play back your programmed sequence.
SPACE - When this indicator is lit, the unit is in SPACE mode and will insert 4 seconds of space between tracks.

❻ PLAYBACK mode
PLAY - This indicator is lit when the unit is playing a track.
PAUSE - This indicator is lit when the unit is PAUSE mode (i.e., you have pressed PAUSE to temporarily stop playback).

❼ TRACK indicator
When a disc is loaded but not playing, the TRACK indicator displays the total number of tracks on that disc. During playback, the indicator displays the number of the track currently being played. During programming, it displays the number of the track most recently selected.

❽ INDEX indicator
Some discs that contain very long track may have those tracks subdivided into shorter sections. For example, a long classical piece may be divided into movements, each of which may have an index number. The INDEX indicator displays the number of the subdivision of a track currently being played. If the track has no subdivisions, the INDEX indicator will display a 1 during playback. During programming, the INDEX light goes out and the indicator displays the total number of tracks selected in the programmed sequence.

❾ TIME indicator
When a disc is loaded but not playing, the TIME indicator displays the total amount of playback time on that disc. During playback, depending on the state of the TIME button (11), the indicator displays one of the following
• The time that has elapsed since the beginning of the current track.
• The time that remains on the currently selected track. The mark – (minus) will be displayed if the indicator is in this mode.
• The time that remains on either the entire disc or on the programmed selections. The mark – (minus) will be displayed if the indicator is in this mode. Note that if you have programmed more than 99 minutes in your selection, only dashes will appear in this mode.

❿ DISPLAY button
This button turns the display on and off. When you turn the display off in PLAY mode, the entire display goes off. In PAUSE mode, most of the display goes off, but the track number is still displayed. In STOP mode, most of the display goes off, but the total number of tracks on the disc is still displayed. In some systems, turning the fluorescent display off may provide the purest possible sound quality during playback.

⓫ TIME button
During playback or programming, the button cycles through the three TIME display modes
• The time that has elapsed since the beginning of the current track.
• The time that remains on the currently selected track.
• The time that remains on either the entire disc or the programmed sequence.

⓬ REPEAT button
This button puts your compact disc player in and out of REPEAT mode. In REPEAT mode, the unit will continually play back either the entire disc or the programmed sequence of tracks. Press the button once to turn on REPEAT mode; press again to turn off REPEAT mode. When the unit is in REPEAT mode, the FUNCTION indicator (5) will display the word REPEAT.

⓭ PROGRAM button
This button puts your compact disc player in and out of PROGRAM mode. Press the button once to turn on PROGRAM mode; press again to turn it off. In PROGRAM mode, you can program a set of tracks to play in any sequence. (For instructions on programming a sequence of tracks, see the Operations section of this manual.) When the unit is in PROGRAM mode, the FUNCTION indicator (5) will display the word PROG in red.

⓮ Playback controls
PLAY- ► The PLAY button starts playback of a track.
PAUSE - ■■ Pressing the PAUSE button temporarily stops playback. Pressing the PAUSE button again, or pressing PLAY, resumes playback at the precise point where playback left off.
STOP- ■ The STOP button stops playback. When you press PLAY, playback will start either at the beginning of the disc or programmed sequence, or at any track you select.
SKIP BACK- ⏮ Pressing this button once skips back to the beginning of the present track. If you are in PLAY mode, playback will resume. Holding the button down skips backward to the beginning of each preceding track until the first track on the disc is reached.
SKIP FORWARD- ⏭ Pressing this button once skips forward to the beginning of the next track. If you are in PLAY mode, playback will resume. Holding the button down skips forward to the beginning of each subsequent track until the last track on the disc is reached.
SEARCH BACK- ◄◄ Holding down this button during playback reverses rapidly through the disc. This function is similar to the "Rewind" function on a tape deck.
SEARCH FORWARD- ►► Holding down this button during playback speeds rapidly forward through the disc. This function is similar to the "Fast forward" function on a tape deck.

Remote control

The remote control for the HD7425 provides the same functions found on the front panel of the compact disc player itself. In addition, the remote control provides some functions that are not found on the front panel.

The functions found on the remote control that are not found on the front panel are INTRO, A-B, CLEAR, CHECK, SPACE, and the 1-10 and +10 keys. These five functions are described below (for other functions, see the descriptions above).

⓯ CLEAR button
The CLEAR button removes tracks from your programmed sequence one by one starting with the last track entered. Each time you clear a track from the programmed sequence, that track's time is deleted from the total time displayed. This button is used only in PROGRAM mode.

⓰ CHECK button
When a disc is loaded but not playing (STOP mode), you can press the CHECK button to see the playback time of each track on the disc. Each time you press the CHECK button, the next track is displayed along with its playback time. When you have stepped sequentially through all the tracks on the disc, another press of the CHECK button displays the total playback time of the entire disc. In PROGRAM mode, the CHECK button displays the cumulative time of the tracks in the programmed sequence. That is, the first press displays the time of the first programmed track, the second press displays the cumulative playback time of the first and second tracks, and so on.

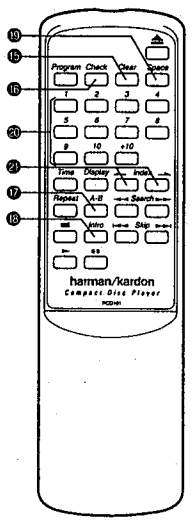
⓱ A-B button
This button puts your compact disc player in and out of A-B mode. In A-B mode, the unit will continually play back a "phrase" or section of your disc beginning at point A and ending at point B. (For instructions on repeating a section of a disc, see the Operations section of this manual.) When the unit is in A-B mode, the FUNCTION indicator (5) will display REPEAT A-B.

⓲ INTRO button
This button puts your compact disc player in and out of INTRO SCAN mode. When INTRO SCAN is on and you press PLAY, the unit plays only the first 15 seconds of each track before moving on to the next. Press the button once to turn on INTRO SCAN mode; press again to turn it off and stop the scanning. When the unit is in INTRO SCAN mode, the FUNCTION indicator (5) will display the word INTRO.

⓳ SPACE button
This button puts your compact disc player in and out of SPACE mode. Press the button once to turn on SPACE mode; press again to turn it off. In SPACE mode, the unit inserts 4 seconds of blank space between tracks. This is particularly useful if you are recording music from a compact disc onto a tape. Tape decks with a Music Search feature will be able to use the 4 seconds of space to correctly identify the beginning of each selection on the tape. When the unit is in SPACE mode, the FUNCTION indicator (5) will display the word SPACE.

⓴ Track selection buttons
This set of buttons (numbered 1 through 10 and +10) enables you to directly select the track you want to play. To select a track with a number higher than 10, press the +10 button, then press the button that will add up to the number of the track you want. For example, to select track 14, press +10, then press 4. If you select a track number that does not exist on your disc, the TRACK indicator will continue to display the number of the last track on the disc. When PROGRAM mode is off, pressing a track button plays the track you select. When PROGRAM mode is on, pressing a track button programs that track into your sequence.

㉑ INDEX buttons
Some discs contain long selections that may subdivided into shorter sections (for example, operas). Just as the tracks are marked by the track number, these shorter sections may be marked by index numbers. When you have started playback of the desired track, you can use the INDEX UP and INDEX DOWN buttons to jump to a desired index selection. Each time you press an INDEX button, the INDEX indicator displays the next higher or lower index number. If you continue pressing the button until the indicated index number is higher than the actual number of index selections on the disc, playback will start from the nearest index selection.



DISASSEMBLY PROCEDURES (REFER TO PAGES 27 THROUGH 29 AND 31)

[1] CABINET TOP (124) REMOVAL

Remove 6 screws (A) and then remove the Cabinet Top (124).

[2] FRONT PANEL ASS'Y (AA) REMOVAL

1. Remove the Cabinet Top (124), referring to the previous step [1].
2. Disconnect the jumper lead (JL401) from connector (CN201) on the Main P.C. Board (PCB-1).
3. Open the lid of connector (CN103) on the Main P.C. Board (PCB-1), then disconnect the jumper lead (JL103).
4. Connect the power cord and turn on the power by pressing the power switch.
5. Open the Disc Tray (1) by pressing the Open/Close button.
6. With the Disc Tray (1) opened as it is, pull out the power plug.
7. Remove the Lid (130) from the both side rails on the disc tray.
8. Remove 5 screws (B) and then remove the Front Panel Ass'y (AA) with the Front P.C. Board (PCB-2).
9. Remove 9 screws (C) and then remove the Front P.C. Board (PCB-2) from the Front Panel Ass'y (AA).
10. Remove 2 screws (D) and then remove the Power Switch P.C. Board (PCB-3) from the Front Panel Ass'y (AA).

[3] MAIN P.C. BOARD (PCB-1) REMOVAL

1. Remove the Cabinet Top (124), referring to the previous step [1].
2. Disconnect the jumper lead (JL401) from connector (CN201) on the Main P.C. Board (PCB-1).
3. Open the lid of connector (CN103) on the Main P.C. Board (PCB-1), then disconnect the jumper lead (JL103).
4. Disconnect the connector with lead wires (LCN113, LCN114, LCN115 and LCN117) from connectors (CN113, CN114, CN115 and CN117) on the CD Player Mechanical Assembly (104).
5. Remove 14 screws (E) and then remove the Main P.C. Board (PCB-1).

[4] CD PLAYER MECHANICAL ASSEMBLY (104) REMOVAL

1. Remove the Cabinet Top (124), referring to the previous step [1].
2. Disconnect the connector with lead wires (LCN113, LCN114, LCN115 and LCN117) from connectors (CN113, CN114, CN115 and CN117) on the CD Player Mechanical Assembly (104).
3. Remove 4 screws (F) and then remove the CD Player Mechanical Assembly (104) backward.

DISASSEMBLING THE CD PLAYER MECHANICAL ASSEMBLY

[5] DISC TRAY (1) REMOVAL

1. Remove the Cabinet Top (124), referring to the previous step [1].
2. Connect the Power cord and turn on the power by pressing the Power switch.
3. Open the Disc Tray (1) by pressing the Open/Close button.
4. With the Disc Tray (1) opened as it is, pull out the power plug.
5. Pull out Holder with Tray.
6. Pull out the Disc Tray (1) while pulling clamps A and B outward. (Refer to Top View of page 8)

[6] OPTICAL PICK-UP (57) REMOVAL

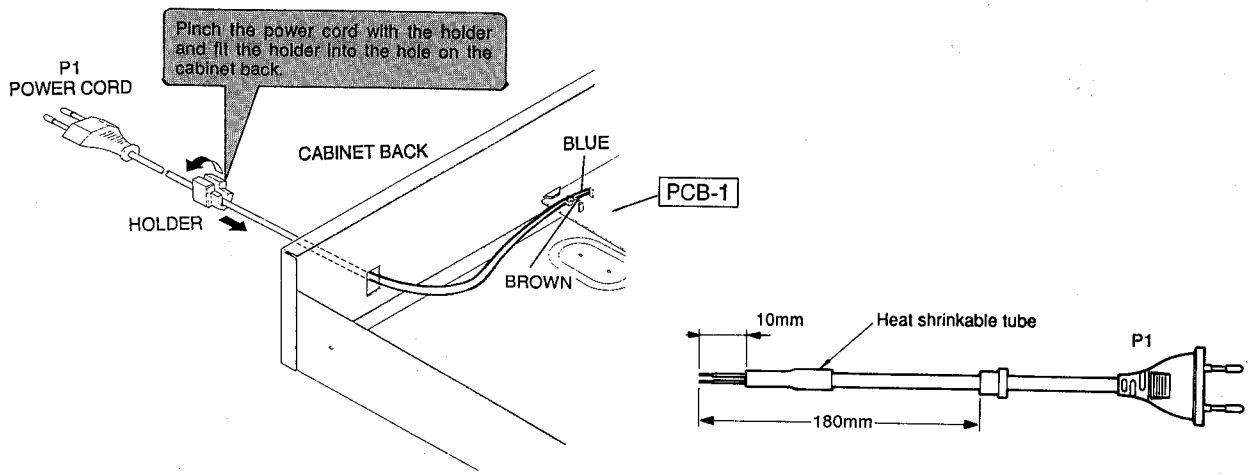
1. Remove the CD Player Mechanical Assembly (104), referring to the previous step [4].
2. Remove 4 screws (G) and then remove the Disc Motor Ass'y (59) with Pick-up, Slide Motor and etc.
3. Remove the Gear (58).
4. Remove the Shaft (51) and then remove the Pick-up (57).

[7] SLIDE MOTOR (57) REMOVAL

1. Remove the CD Player Mechanical Ass'y (104), referring to the previous step [4].
2. Unsolder the terminal of Disc and Slide Motors, then remove the Motor P.C. Board (61).
3. Remove 2 screws (H) and then remove the Slide Motor (60).

POWER CORD REPLACEMENT (FOR SERVICE ENGINEERS OTHER THAN NORTH AMERICA)

In order to prevent fire or shock hazard when replacing the power cord, follow the procedure below to replace the part with the standard supply parts.



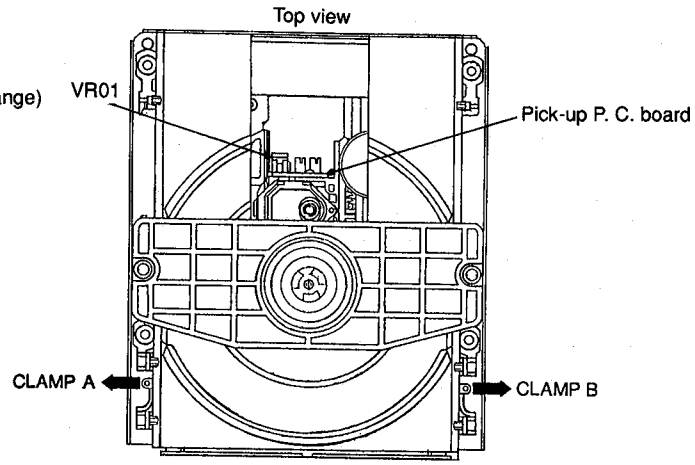
ADJUSTMENT PROCEDURE

1. Instruments required

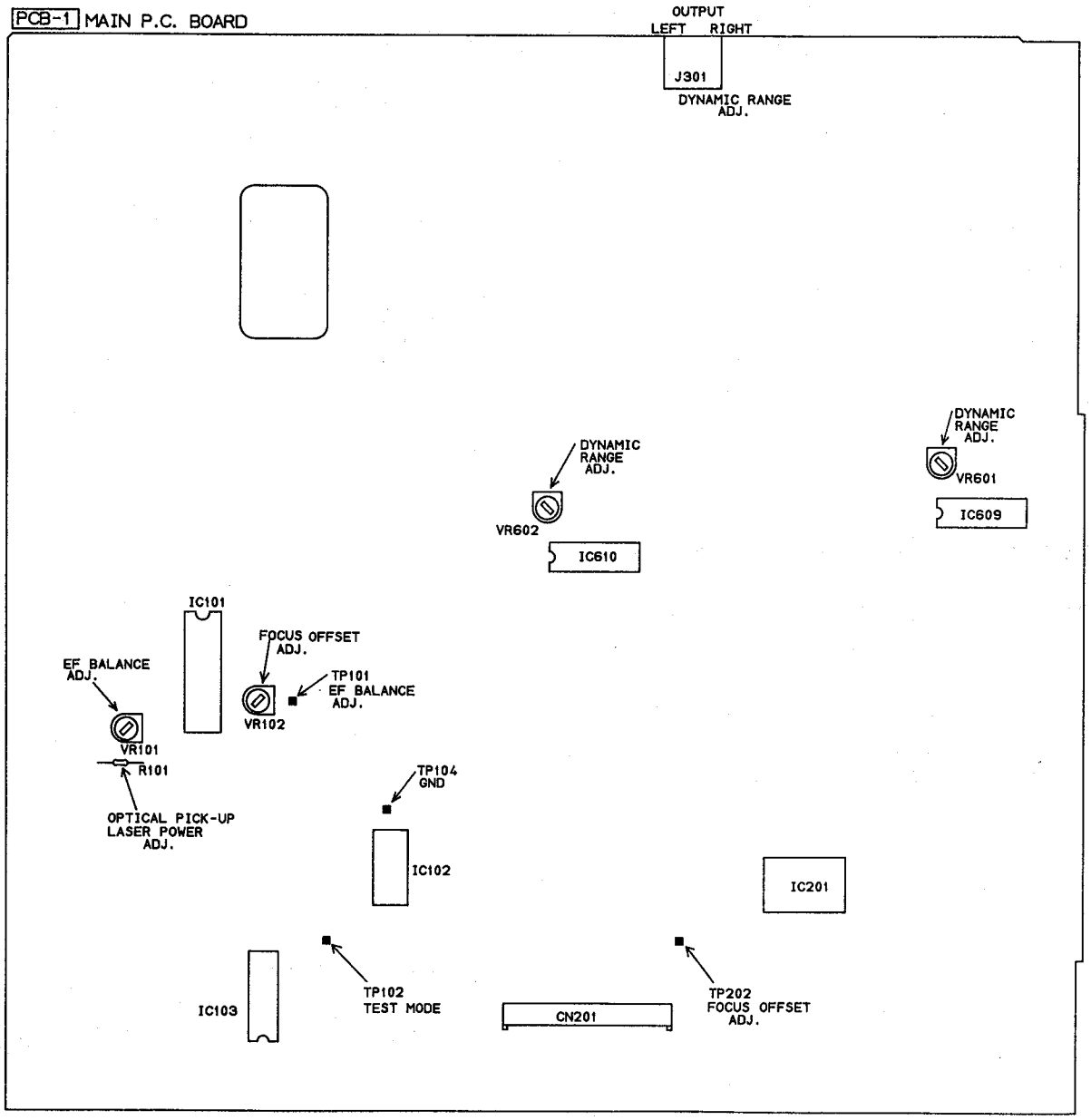
- DC voltmeter
- Oscilloscope (3 or more modes, 100 MHz, input select DC range)
- Jitter meter
- Test disc: EIAJ CD-1

2. Adjustment points

2-1 Adjusting screw layout for CD player mechanical assembly.



2-2 VR and test point layout for main P.C. board.



ADJUSTMENT POINT

3. Optical Pick-up Laser Power Adjustment

The specified value for adjustment varies with the type of the pick-up in use. Obtain the voltage value according to the following procedure.

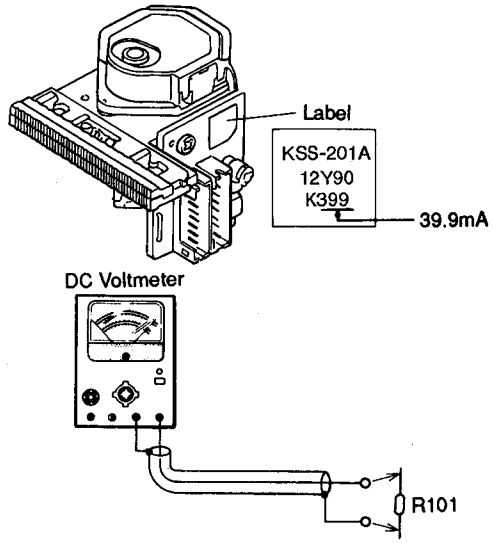
(a) Read the current value on the label of the pick-up P.C.board.

(b) Using the amperage of the current and the following equation, calculate the voltage value.
When the current is 39.9mA:
V=0.0399A × 22=0.8778V

(1) Connect the DC voltmeter to both ends of R101.

(2) Insert EIAJ CD-1 test disc and place the unit in the Play mode.

(3) Adjust VR01 in the pick-up P.C.board to the voltage obtained in step (b) above.



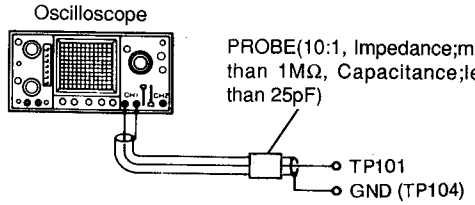
4. EF Balance Adjustment

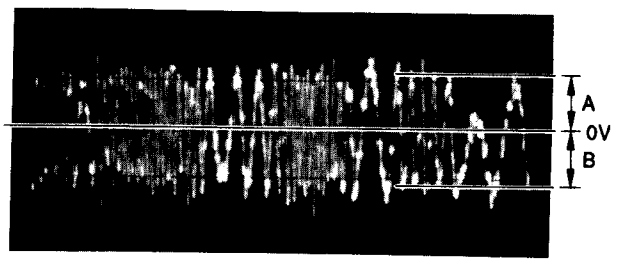
(1) Connect the oscilloscope (0.5V/div, 5 msec./div, DC mode) to TP101 and GND (TP104).
Short-circuit TP102 and GND.

(2) Insert EIAJ CD-1 test disc and place the unit in the Play mode.

(3) Adjust VR101 so that the amplitude above and below the zero DC line becomes equal. (Amplitude A = Amplitude B)

NOTE: Instead of using the DC input of an oscilloscope, you may also use a DC null voltmeter for this alignment.





A=B

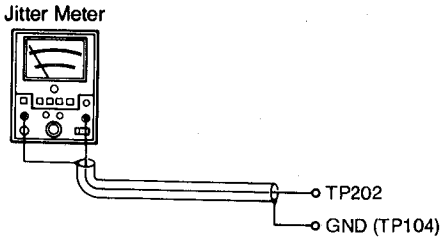
(approx. 1.5Vp-p)

5. Focus Offset Adjustment

(1) Connect the Jitter meter to TP202 and GND (TP104).

(2) Insert EIAJ CD-1 test disc and place the unit in the play mode.

(3) Adjust VR102 until the jitter for optimum sensitivity.

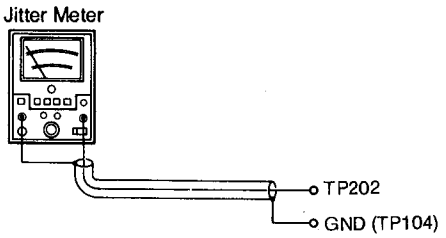


6. Jitter Inclination Confirmation

(1) Connect the Jitter meter (sigma range) to TP202 and GND (TP104).

(2) Insert EIAJ CD-1 test disc and place the unit in the Play mode.

(3) Confirm the jitter meter reading is less than 30ns.



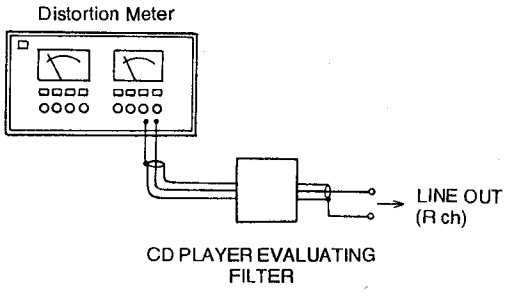
7. Dynamic Range Adjustment

(1) Connect the distortion meter to line out jacks (R ch).

(2) Insert EIAJ CD-1 test disc track number 5 (recorded level −60 dB) and place the unit in the play mode.

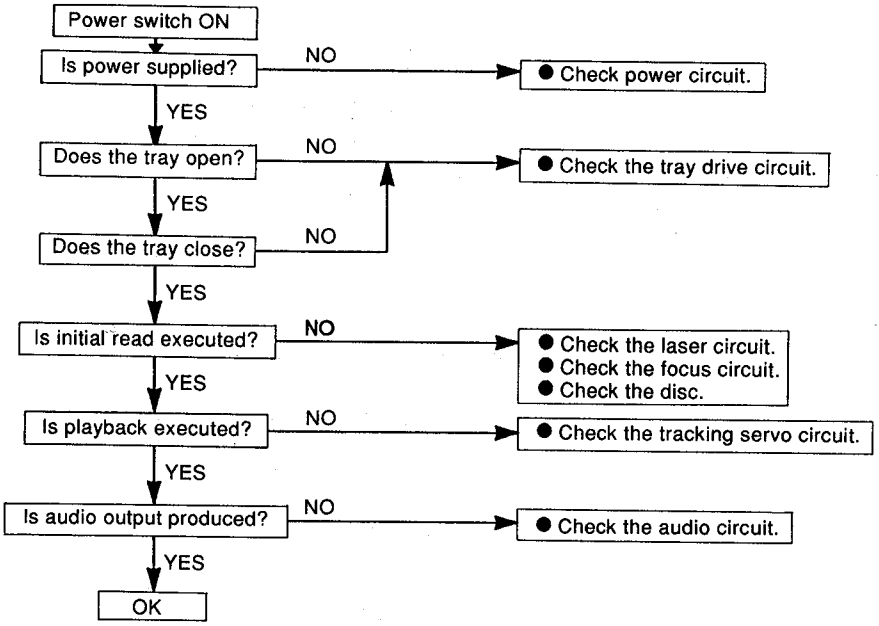
(3) Adjust VR602 so that the distortion is minimized.

(4) Adjust VR601 so that the distortion is minimized.

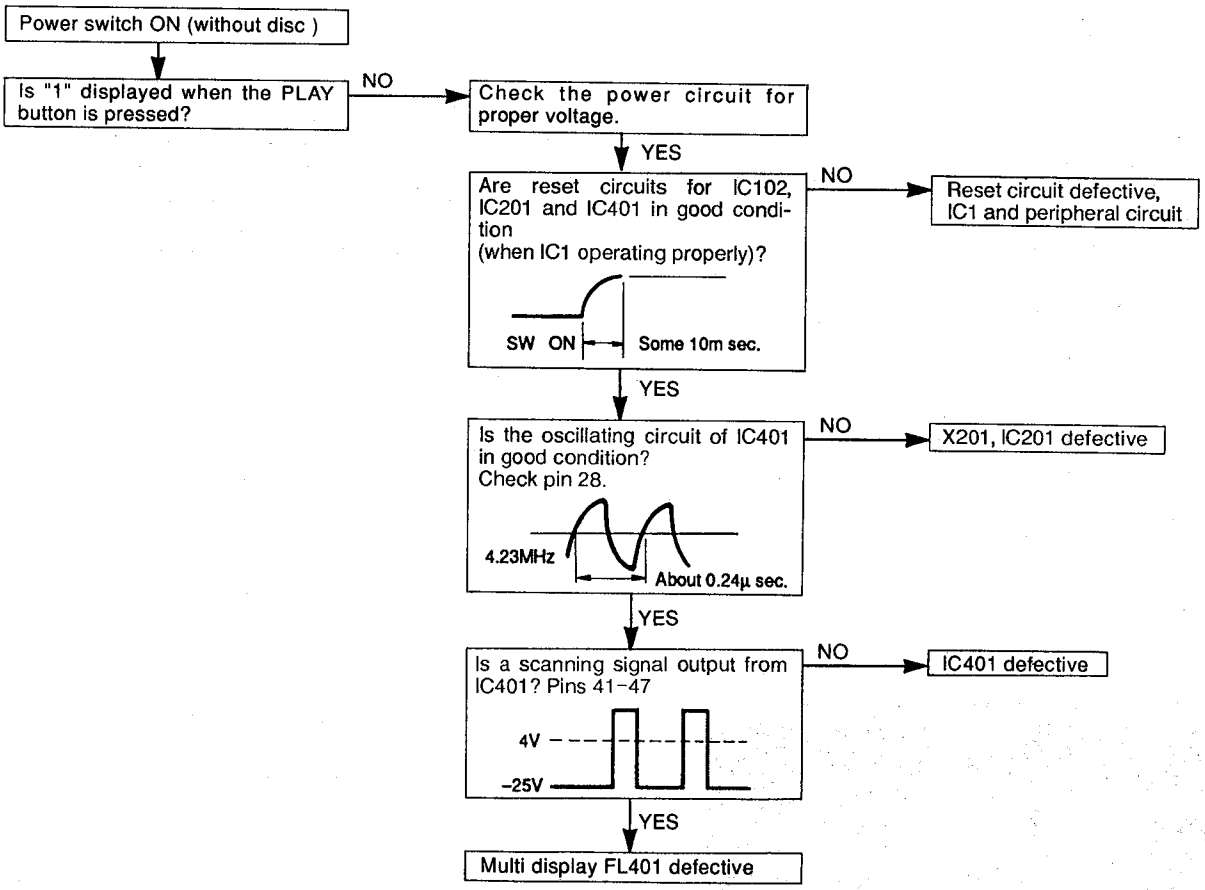


TROUBLE SHOOTING

When a trouble has occurred, first check the pick-up lens for dirt and each connector for tight and secure connection. If the problem persists after checking both of these items, use the following check procedures.

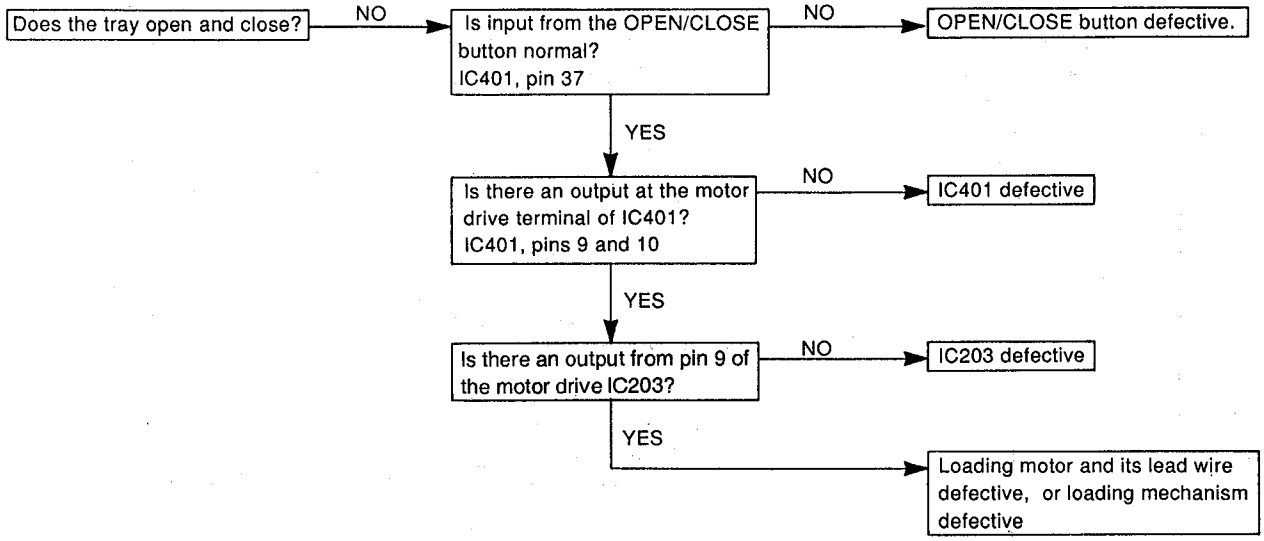


(1) When Multi Display fails to light properly.



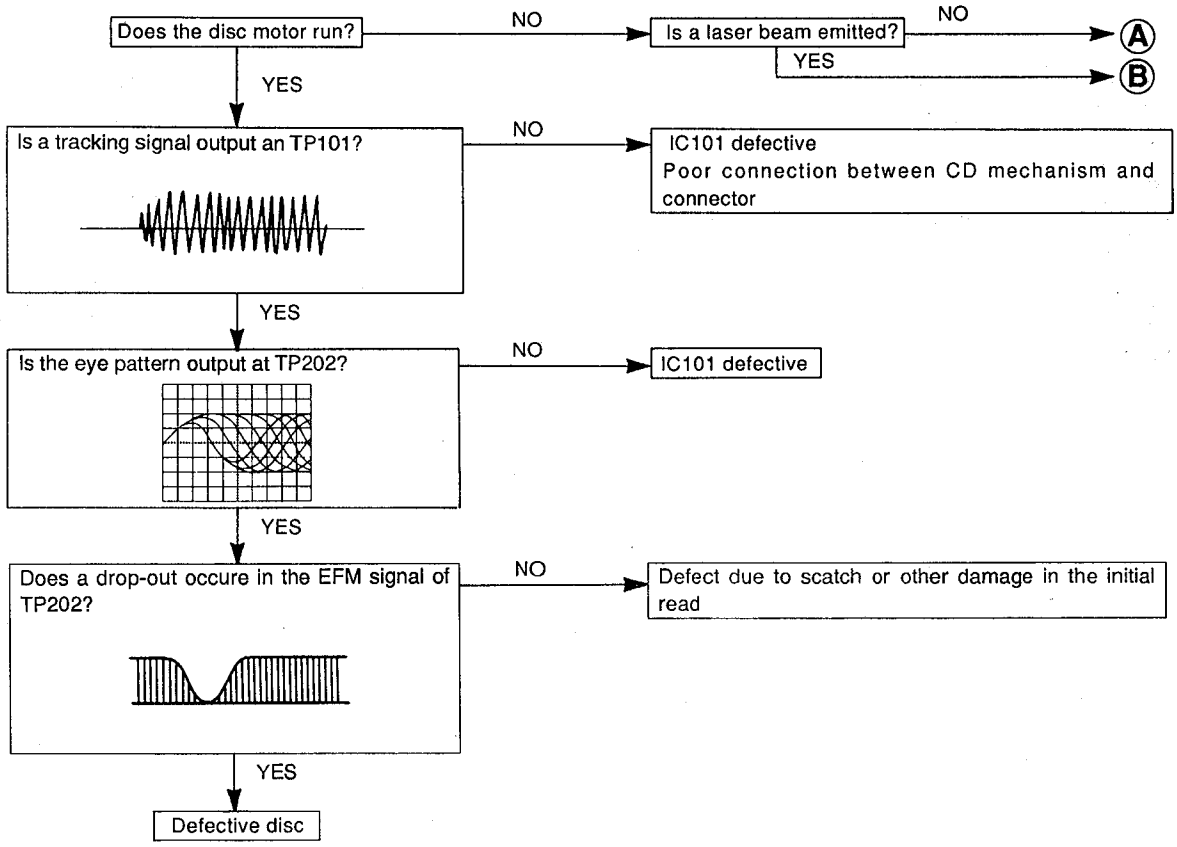
When a problem occurres, first check the pick-up lens for dirt and each connector for tight and secure connection. If the problem persists after checking both of these items, use the following check procedures.

(2) When the tray fails to operate properly.

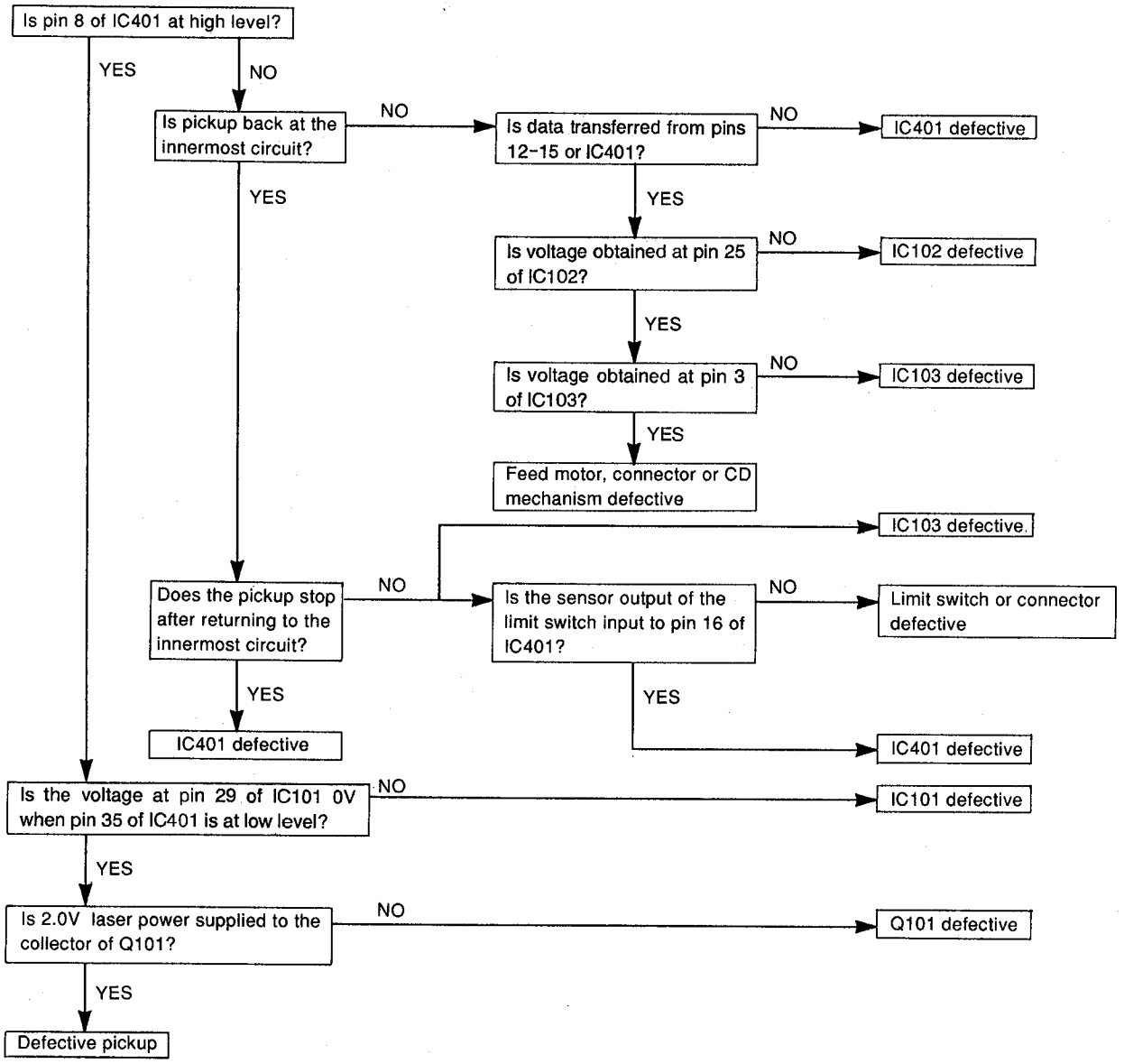

Does the tray open and close?
NO
Is input from the OPEN/CLOSE button normal?
IC401, pin 37
NO
OPEN/CLOSE button defective.
YES
Is there an output at the motor drive terminal of IC401?
IC401, pins 9 and 10
NO
IC401 defective
YES
Is there an output from pin 9 of the motor drive IC203?
NO
IC203 defective
YES
Loading motor and its lead wire defective, or loading mechanism defective

(3) When initial read cannot be executed.

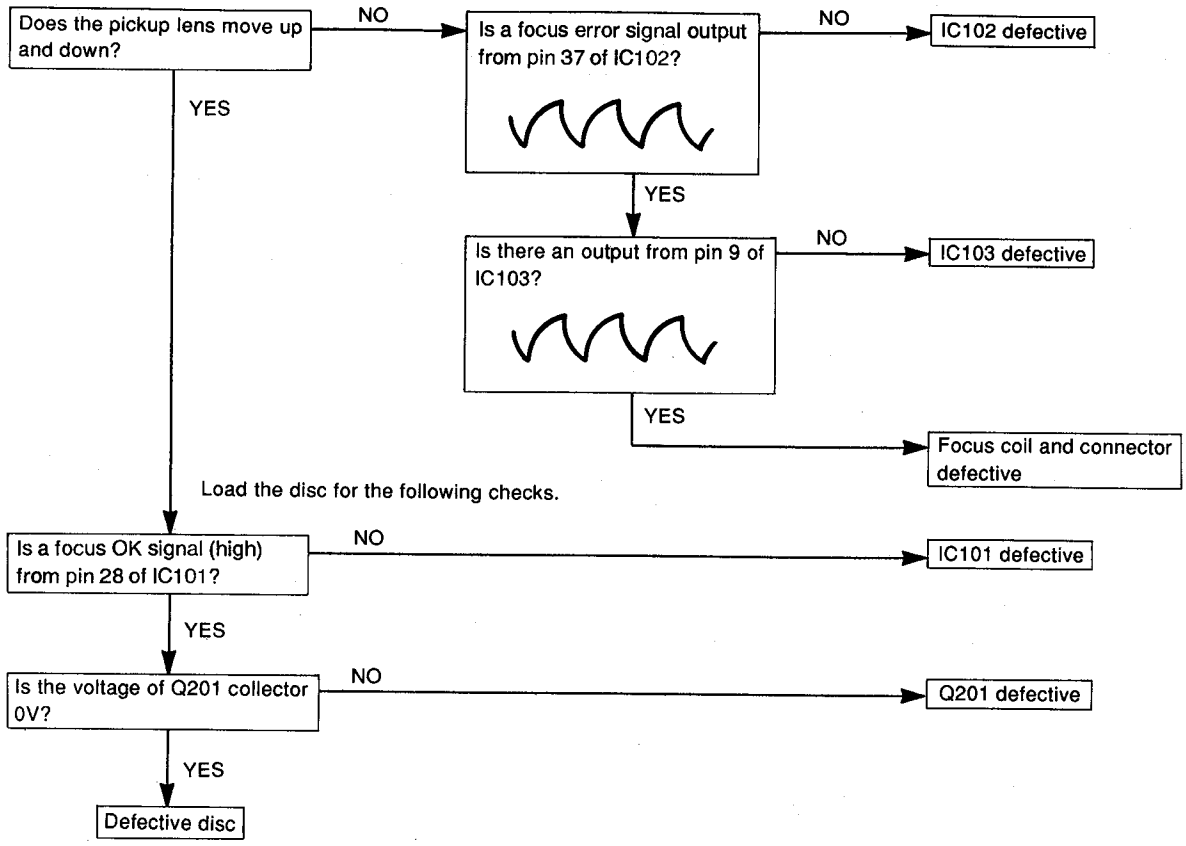
The following checks can be done without a disc loaded.



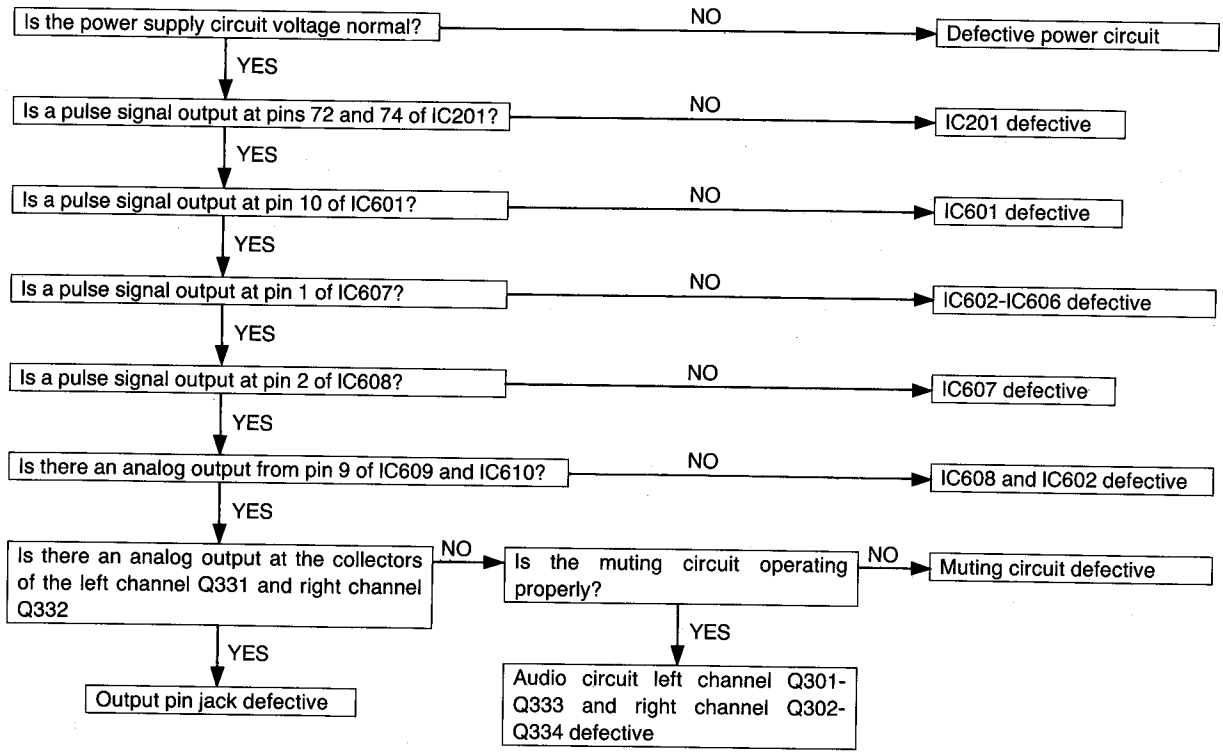
Ⓐ When laser beam is not emitted.



(B) When laser beam is emitted.



When there is no audio output.


Is the power supply circuit voltage normal?
NO
Defective power circuit
YES
Is a pulse signal output at pins 72 and 74 of IC201?
NO
IC201 defective
YES
Is a pulse signal output at pin 10 of IC601?
NO
IC601 defective
YES
Is a pulse signal output at pin 1 of IC607?
NO
IC602-IC606 defective
YES
Is a pulse signal output at pin 2 of IC608?
NO
IC607 defective
YES
Is there an analog output from pin 9 of IC609 and IC610?
NO
IC608 and IC602 defective
YES
Is there an analog output at the collectors of the left channel Q331 and right channel Q332
NO
Is the muting circuit operating properly?
NO
Muting circuit defective
YES
YES
Output pin jack defective
Audio circuit left channel Q301-Q333 and right channel Q302-Q334 defective

IC TERMINAL FUNCTIONS

IC NUMBER	TERMINAL NUMBER	PORT NAME	TERMINAL CODE	I/O	OUTLINE OF FUNCTIONS
IC101	1	RFI		I	RF summing amp. input terminal.
	2	RFO		O	RF summing amp. output terminal.
	3	RF-		I	RF summing amp. return input terminal.
	4	P/N		I	Laser diode P/N select terminal.
	5	LD		O	APC LD amp. output terminal.
	6	PD		I	APC PD amp. input terminal.
	7	PD1		I	RF I-V amp. (1) invert input terminal.
	8	PD2		I	RF I-V amp. (2) invert input terminal.
	9	VC		-	GND terminal.
	10	F		I	F I-V amp. invert input terminal.
	11	E		I	E I-V amp. invert input terminal.
	12	EO		O	E I-V amp. output terminal.
	13	EI		I	E I-V amp. return input terminal.
	14	VR		O	DC voltage output terminal.
	15	CC2		I	DEFECT signal input terminal.
	16	CC1		O	DEFECT signal output terminal.
	17	V_{EE}		-	Negative power terminal.
	18	FE BIAS		I	Focus error amp. bias terminal.
	19	FE		O	Focus error amp. output terminal.
	20	TE		O	Tracking error amp. output terminal.
	21	DEFECT		O	DEFECT comparator output terminal.
	22	MIRR		O	MIRR comparator output terminal.
	23	CP		I	MIRR hold capacitor connect terminal.
	24	CB		I	DEFECT hold capacitor connect terminal.
	25	DGND		-	GND terminal.
	26	ASY		I	Auto asymmetry control input terminal.
	27	EFM		O	EFM comparator output terminal.
	28	FOK		O	Focus OK comparator output temrinal.
	29	$\overline{\text{LD ON}}$		I	Laser diode on/off select terminal.
	30	V_{CC}		-	Positive power terminal.
IC102	1	ALPC SW OUT	ALPC output	O	Auto laser power control output terminal.
	2	ALPC SW IN	ALPC input	I	Auto laser power control input terminal.
	3	TE IN	Pre amp. input	I	Tracking error signal input terminal.
	4	TC IN	Pre amp. input	I	Track cross signal input terminal.
	5	MR	Pre amp. input	I	Mirror detected signal input terminal.
	6	Jump Flag	Mi-com I/O	O	Outputs "H" under jump function.
	8	HF OK IN	Pre amp. input	I	HF OK signal input terminal.
	9	$\overline{\text{HFD}}$	Mi-com I/O	O	"1" indicates that MR input is "1" and track servo loop is off (TS OFF, JF, JR).
	10	DATA OUT	Mi-com I/O	O	Inner condition output changed by command modes.
	11	$\overline{\text{JP1}}$	Mi-com I/O	I	1 track jump control signal. Usually "H".
	12	MSD	Mi-com I/O	I	Serial data input terminal (LSB first, 8-bit data).
	13	$\overline{\text{MLA}}$	Mi-com I/O	I	Latch signal of serial data from mi-com to servo IC.
	14	MCK	Mi-com I/O	I	Clock signal of serial data from mi-com to servo IC. Receives data on leading edge.
	15	$\overline{\text{ACLR}}$	Mi-com I/O	I	All clear input. (Clear inner registors and flip-flops by "L" signal.)
	18	Bias	Power supply	O	$V_{CC}/2$ bias power supply output when single-pole power supply is used.
	19	COM	Power supply	I	Common terminal. Connect to GND when double-pole power supply is used and to BIAS when single-pole power supply is used.
	20	GND	Power supply	I	GND terminal.
	21	V_{EE}	Power supply	I	Negative power terminal. Connect to GND when single-pole power supply is used.
	22	C·FSR	Focus servo	-	Connect capacitor which determines time constant of focus search waveform.
	23	I-Ref	Power supply	I	Terminal for connecting resistor for setting current value of reference current source.
	24	V_{CC}	Power supply	I	Positive power terminal.
	25	SS OUT	Slide servo	O	Operation amplifier SS output.
	26	SS⊖	Slide servo	I	Operation amplifier SS reverse input.
	27	SS⊕	Slide servo	I	Operation amplifier SS non-reverse input.
	28	TS OUT	Track servo	O	Operation amplifier TA output.
	29	TS⊖	Track servo	I	Operation amplifier TA reverse input.
	30	TG2	Track servo	-	Track gain select switch TG2 output. Set to open or common level.
	31	TS⊕	Track servo	I	Operation amplifier TA non-reverse input.
	32	TG1	Track servo	-	Track gain select switch TG1 output. Set to open or common level.
	33	TE OUT	Track servo	O	Operation amplifier TE output.
	34	TE⊖	Track servo	I	Operation amplifier TE reverse input.

IC NUMBER	TERMINAL NUMBER	PORT NAME	TERMINAL CODE	I/O	OUTLINE OF FUNCTIONS
IC102	35	FSR IN	Focus servo	I	Focus search voltage level detector input.
	36	FG	Focus servo	-	Focus gain select switch FG output. Set to open or common level.
	37	FS OUT	Focus servo	O	Operation amplifier FA output.
	38	FS⊖	Focus servo	I	Operation amplifier FA reverse input.
	39	FS⊕	Focus servo	I	Operation amplifier FA non-reverse input.
IC103	1	+VIN1		I	Positive input terminal 1 for amp. 1.
	2	−VIN1		I	Negative input terminal 1 for amp. 1.
	3	OUT1		O	Output temrinal 1.
	4	OUT2		O	Output temrinal 2.
	5	−VIN2		I	Negative input terminal 2 for amp. 2.
	6	+VIN2		I	Positive input terminal 2 for amp. 2.
	7	+VIN3		I	Positive input terminal 3 for amp. 3.
	8	−VIN3		I	Negative input terminal 3 for amp. 3.
	9	OUT3		O	Output terminal 3.
	10	NC		-	
	11	NC		-	
	12	V_{CC}		-	Positive power supply.
IC201	1	EMP		O	Emphasis code output. Emphasis = "1"
	2	PWM1		O	Disc motor drive PWM output 1. −
	3	PWM2		O	Disc motor drive PWM output 2. +
	4	DOTX		O	Digital output.
	5	ACRCY		I	Channel status clock input.
	6	TEST1		I	Test mode select input.
	7	DOBSEL		I	Output data bit select.
	8	DASEL1		I	D/A converter interface select input 1.
	9	DASEL2		I	D/A converter interface select input 2.
	10	DASEL3		I	D/A converter interface select input 3.
	11	DASEL4		I	D/A converter interface select input 4.
	12	MSD		I	Microcomputer interface serial data input.
	13	MCK		I	Microcomputer interface shift clock input.
	14	$\overline{MLA}$		I	Microcomputer interface data latch clock input.
	15	$\overline{ACLR}$		I	Microcomputer interface register clear input.
	16	$\overline{HFD}$		I	Play signal absence signal input.
	17	HF		I	Play signal input.
	18	IREF		I	Detection/PLL circuit reference current input.
	19	TLC		O	Slice level control output.
	20	LPF		I/O	PLL loop filter connection terminal.
	21	LOCK/DRD		O	Synchronous/low disc rotate status output.
	22	SYCLK		O	Frame synchronous status output.
	23	$V_{DD}2$		I	5V power supply used for Detection/PLL circuit analog area only.
	24	DRD		O	Low disc rotate status output.
	25	$\overline{EFFK}$		O	EFM frame clock output.
	26	SCINT		O	Subcode Q interrupted signal output.
	27	SQRO		O	Subcode Q register output.
	28	SQRCK		I	Subcode Q register data shift clock input.
	29	SCOR		O	Subcode synchronous signal output.
	30	CRCF		O	Subcode Q CRC check result output.
	31	SCCK		I	Shift clock input for serial subcode data output.
	32	$V_{SS}2$		I	GND terminal.
	33	SCOE2		I	Subcode parallel output channel P to S enable input.
	34	SCOE1		I	Subcode parallel output channel T to W enable input.
	35	SBCW		O	Subcode channel W output.
	36	SBCV		O	Subcode channel V output.
	37	SBCU		O	Subcode channel U output.
	38	SBCT		O	Subcode channel T output.
	39	SBCS		O	Subcode channel S output.
	40	SBCR		O	Subcode channel R output.
	41	SBCQ		O	Subcode channel Q output.
	42	SBCP		O	Subcode channel P output.
	43	$\overline{RAS}$	RT1	O	Row address strobe signal output.
	44	TEST2	TEST2	I	Test made select input.
	45	ROB2	RT2	I/O	External memory data I/O 2.
	46	NC		-	
	47	RT3		I/O	External memory data I/O 1.
	48	RT4		I/O	External memory data I/O 4.

IC NUMBER	TERMINAL NUMBER	PORT NAME	TERMINAL CODE	I/O	OUTLINE OF FUNCTIONS
IC201	49	RT5		O	Column address strobe signal output.
	50	RT6		I/O	External memory data I/O 3.
	51	RT7		O	Write enable signal output.
	52	RT8		I	External memory address output 7.
	53	RT9		O	External memory address output 1.
	54	RT10		O	External memory address output 2.
	55	RT11		O	External memory address output 3.
	56	NC		-	
	57	RT12		O	External memory address output 4.
	58	RT13		O	External memory address output 5.
	59	RT14		O	External memory address output 6.
	60	RT15		O	External memory address output 0.
	61	EST2		O	Error status 2.
	62	EST1		O	Error status 1.
	63	$V_{DD}1$		I	5V power supply.
	64	DOFK		O	OSC frame clock output.
	65	FSCK		O	Clock output. 44.1kHz
	66	C846		O	Clock output. 8.4672MHz
	67	C423		O	Clock output. 4.2336MHz
	68	CKSEL		I	1/2 divider input.
	69	DFSEL		O	1/2 divider output.
	70	XI		I	Crystal oscillator input.
	71	XO		O	Crystal oscillator output.
	72	DO1		O	D/A converter serial data output.
	73	$V_{SS}1$		I	GND terminal.
	74	DSCK		O	D/A converter data shift clock output.
	75	LRCK		O	D/A converter left/right clock output.
	76	DO2		O	Dual D/A converter serial data output.
	77	WDCK		O	D/A converter word clock.
	78	DLRCK		O	D/A converter left/right clock output.
	79	APTL		O	D/A converter deglitch clock L.
	80	APTR		O	D/A converter deglitch clock R.
IC203	1	VSENCE1			
	2	OUT1		O	Output terminal 1.
	3	-VIN1		I	Negative input 1.
	4	+VIN1		I	Positive input 1.
	5	V_{EE}			Negative power supply.
	6	+VIN2		I	Positive input 2.
	7	-VIN2		I	Negative input 2.
	8	OUT2		O	Output terminal 2.
	9	VSENCE2			
	10	V_{CC}			Positive power supply.
IC401	1	V_{CC}			Positive power supply.
	2	$P6_5$		I/O	
	3	$P6_4$		I/O	
	4	$P6_3$		I/O	
	5	$P6_2$		I/O	
	6	$P6_1$		I/O	
	7	$P6_0$		I/O	
	8	$P2_7$	I/O port	I/O	Disc tray open direction driving output.
	9	$P2_6$	I/O port	I/O	Disc tray close direction driving output.
	10	$P2_5$	I/O port	I/O	
	11	$P2_4$	I/O port	I/O	Serial data output.
	12	$P2_3$	I/O port	I/O	Serial data output.
	13	$P2_2$	I/O port	I/O	Data latch clock output.
	14	$P2_1$	I/O port	I/O	
	15	$P2_0$	I/O port	I/O	
	16	$P3_7$	OUT PORT	O	Display output i.
	17	$P3_6$	OUT PORT	O	Display output g.
	18	$P3_5$	OUT PORT	O	Display output f.
	19	$P3_4$	OUT PORT	O	Display output e.
	20	$P3_3$	OUT PORT	O	Display output d.
	21	$P3_2$	OUT PORT	O	Display output c.
	22	$P3_1$	OUT PORT	O	Display output b.
	23	$P3_0$	OUT PORT	O	Display output a.

IC NUMBER	TERMINAL NUMBER	PORT NAME	TERMINAL CODE	I/O	OUTLINE OF FUNCTIONS
IC401	24	$P5_3$			
	25	$P5_2$			
	26	CNV_{SS}			Usually connected to V_{SS}.
	27	$\overline{RESET}$		I	Reset input.
	28	XIN	CLOCK IN	I	Clock input.
	29	XOUT	CLOCK OUT	O	Clock output.
	30	XCIN	CLOCK IN	I	Serial data input.
	31	XCOUT	CLOCK OUT	O	Clock output.
	32	V_{SS}			Power supply.
	33	Ø		O	Timing output.
	34	$P5_7$			
	35	$P5_6$			
	36	$P5_5$			
	37	$P5_4$			
	38	VP		I	Pull down voltage input.
	39	$P5_1$			
	40	$P5_0$			
	41	$P1_7$	OUT PORT	O	Laser diode control output.
	42	$P1_6$	OUT PORT	O	Display output 7.
	43	$P1_5$	OUT PORT	O	Display output 6.
	44	$P1_4$	OUT PORT	O	Display output 5.
	45	$P1_3$	OUT PORT	O	Display output 4.
	46	$P1_2$	OUT PORT	O	Display output 3.
	47	$P1_1$	OUT PORT	O	Display output 2.
	48	$P1_0$	OUT PORT	O	Display output 1.
	49	$P0_7$	I/O port	I/O	Serial data input.
	50	$P0_6$	I/O port	I/O	Frame synchronous state output.
	51	$P0_5$	I/O port	I/O	Low disc rotate state output.
	52	$P0_4$	I/O port	I/O	Sub-code synchronous signal output.
	53	$P0_3$	I/O port	I/O	Sub-code Q check.
	54	$P0_2$	I/O port	I/O	Sub-code channel Q output.
	55	$P0_1$	I/O port	I/O	Interrupt input.
	56	$P0_0$	I/O port	I/O	
	57	$P4_7$			
	58	$P4_6$			
	59	$P4_5$			
	60	$P4_4$			
	61	$P4_3$			
	62	$P4_2$			
	63	$P4_1$			
	64	$P4_0$			
IC601	1	1A			In.
	2	1Y			Out.
	3	2A			In.
	4	2Y			Out.
	5	3A			In.
	6	3Y			Output.
	7	GND			Ground.
	8	4Y			Out.
	9	4A			In.
	10	5Y			Out.
	11	5A			In.
	12	6Y			Out.
	13	6A			In.
	14	V_{CC}			Supply voltage.
IC602 through IC607	1	A			Serial input.
	2	B			Serial input.
	3	Q_A			Output.
	4	Q_B			Output.
	5	Q_C			Output.
	6	Q_D			Output.
	7	GND			Ground.
	8	CP			Clock pulse.
	9	$\overline{MR}$			Master reset clear.
	10	Q_E			Output.

IC NUMBER	TERMINAL NUMBER	PORT NAME	TERMINAL CODE	I/O	OUTLINE OF FUNCTIONS
IC602 through IC607	11	Q_F			Output.
	12	Q_G			Output.
	13	Q_H			Output.
	14	V_{CC}			Supply voltage.
IC608	1	1CLR		I	Clear input.
	2	1D		I	Date input.
	3	1CK		I	Clock input.
	4	1PR		I	Preset.
	5	1Q		O	Output.
	6	$1\overline{Q}$		O	Output.
	7	GND			Ground.
	8	$2\overline{Q}$		O	Output.
	9	2Q		O	Output.
	10	2PR		I	Preset.
	11	2CK		I	Clock input.
	12	2D		I	Data input.
	13	2CLR		I	Clear input.
	14	V_{CC}			Power supply.
IC609, IC610	1	$-V_S$		-	Negative analog power supply.
	2	DIG GND		-	Digital ground.
	3	+VI		-	Positive logic power supply.
	4	NC		-	
	5	CLK		I	Clock input.
	6	LEC		I	Latch enable control input.
	7	DATA		I	Data input.
	8	-VI		-	Negative logic power supply.
	9	VOUT		O	Voltage output.
	10	RF		I	Feedback resistor.
	11	SJ		I	Summing junction.
	12	ANA GND		-	Analog ground.
	13	IOUT		O	Current output.
	14	MSB ADJ		-	MSB adjustment terminal.
	15	V POT		-	Potentiometer terminal.
	16	$+V_{CC}$		-	Positive analog power terminal.
IC611	1	SW1 I/O		I/O	SW1 input/output terminal.
	2	SW1 O/I		I/O	SW1 output/input terminal.
	3	SW2 O/I		I/O	SW2 output/input terminal.
	4	SW2 I/O		I/O	SW2 input/output terminal.
	5	CONT2		I	Control input 2 terminal.
	6	CONT3		I	Control input 3 terminal.
	7	V_{SS}			Negative power supply.
	8	SW3 I/O		I/O	SW3 input/output terminal.
	9	SW3 O/I		I/O	SW3 output/input terminal.
	10	SW4 O/I		I/O	SW4 output/input terminal.
	11	SW4 I/O		I/O	SW4 input/output terminal.
	12	CONT4		I	Control input 4 terminal.
	13	CONT1		I	Control input 1 terminal.
	14	V_{DD}			Positive power supply.
IC801	1	1Y		O	Output terminal 1.
	2	1A		I	Input terminal 1.
	3	1B		I	Input terminal 1.
	4	2Y		O	Output terminal 2.
	5	2A		I	Input terminal 2.
	6	2B		I	Input terminal 2.
	7	GND			Ground terminal.
	8	3A		I	Input terminal 3.
	9	3B		I	Input terminal 3.
	10	3Y		O	Output terminal 3.
	11	4A		I	Input terminal 4.
	12	4B		I	Input terminal 4.
	13	4Y		O	Output terminal 4.
	14	V_{CC}			Power supply terminal.

CIRCUIT DESCRIPTION

1. APC CIRCUIT

A semiconductor laser is used as the light source for the optical pickup. As the output from the semiconductor laser changes radically with changes in temperature, a circuit must be provided to stabilize this output. For this purpose, a monitor diode which detects the optical output of the laser diode is used in the semiconductor laser.
As the laser diode emits light from its bonded surface, light is emitted both in front and behind. The light emitted behind is monitored with the monitor diode installed on its rear surface, and the optical output is thus controlled. The light emitted in front becomes the light source for the pickup.

Fig. 1 shows the APC circuit.
When the temperature rises and the optical output decreases, the monitor diode current (IS) decreases, the electric potential of IC101 pin 5 rises, the base current of the driving transistor increases, and the laser diode current increases. This causes the reduced optical output to return to its former level.

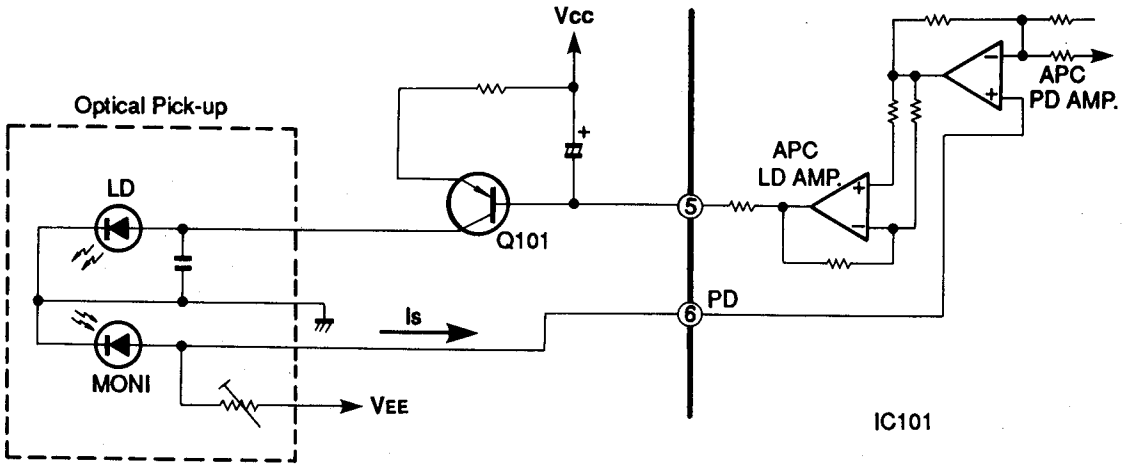
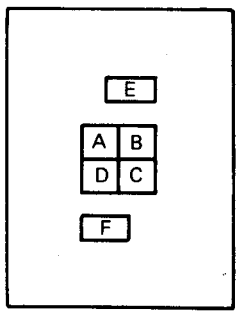


Fig. 1

2. FOCUS SERVO

2-1. Optical pickup

This set employs a three-beam optical pickup comprised of six division photodiodes, A through F as shown in Fig. 2. The four photodiodes (A through D) at the center provide focus error detection by using their property to allow the beam to focus into a round image only at a certain point.
The sums of outputs from diagonal two elements of four division photodiodes (A+C and B+D) are compared by the differential amplifier in IC101 to detect the shape of the beam image.
The remaining two diodes (E and F) provide tracking error detection by means of sub-beam spots.



Three spotted (six-division) photo diodes

Fig. 2

2-2. Focus error detecting operation

The reflected laser beam from a disc is polarized 90° with the beam-splitter and sent to the cylindrical lens. The beam passed through this cylindrical lens is then sent to the four division photodiodes and focuses into an image whose shape varies with the distance between the disc and the objective lens. Such change in the beam shape causes the current flowing from the photodiodes to vary .

Shown in Fig. 3 is the principle of the focus error detection.
The currents from the photodiodes (A+C and B+D) are applied to pins 7 and 8 of IC101 and converted to voltage by RF I-V amplifiers (1) and (2) included in IC101.

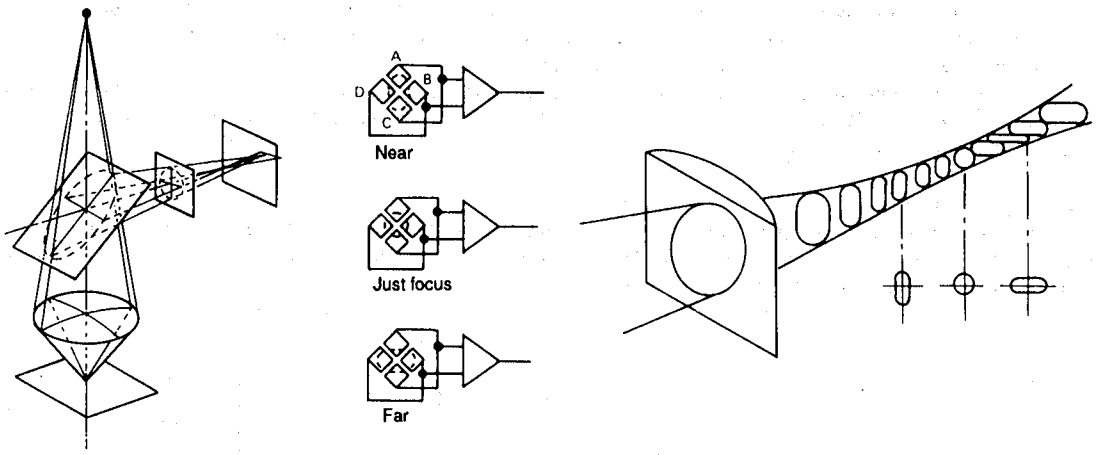


Fig.3

2-3. Focus servo control operation

The focus error signal, after begin converted to voltage by the RF I-V amplifier, is transmitted to the operation amplifier in the IC and output from pin 19.

When the disc to objective lens distance is in just focus, the beam forms a true round. In this state, the beams applied to four elements of four division photodiodes become equal and thus the output provided then is 0(zero). When the disc to objective lens distance is too close (near focus), the beam is reflected divergently to form an oval in crosswise direction. In this state, the outputs provided from photodiodes A and C are higher than those from B and D, resulting in negative (-) output voltage. On the other hand, when the distance is too far (far focus), the beam is reflectd convergently to form an oval in longitudinal direction. Then the outputs from photodiodes B and D are higher, resulting in positive (+) output.

The output voltage (focus error signal) from pin 19 of IC101 passes through IC102, in from pin 39 and out from pin 37, and IC103, in from pin 7 out from pin 9 as shown in Fig. 4. It is amplified in each IC and fed to the focus coil which then drives the objective lens of the pickup.

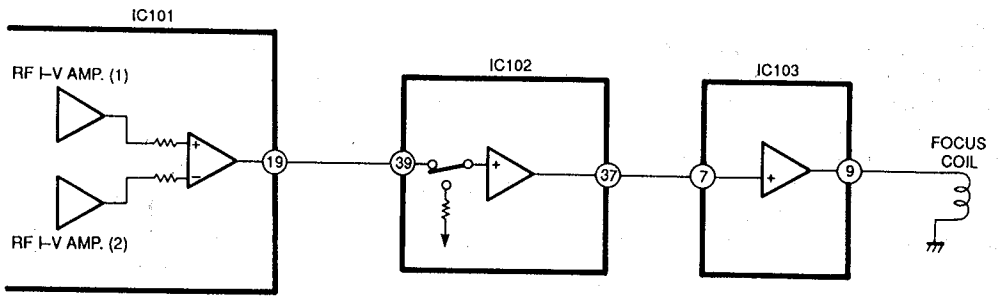


Fig. 4

2-4. Tracking error detection system

Fig. 5 shows the principle of the tracking error detection system which employs the three beam system.

The laser beam is divided into the main beam and two sub-beams by diffraction grating and they are arranged on one line. The center line connecting these three beams has a slight offset angle against the main beam. The main beam is received by photodiodes A, B, C and D and two sub-beams by E and F respectively.

Fig. 5-A shows the on-track state. As both auxiliary beams 1 and 2 are slightly on the track in this state, the outputs of photodiodes E and F are equal and the tracking signal is 0(zero). When the track is shifted to the left (Fig. 5-B), the auxiliary beam 1 is off the pit. This allows more light to be received by the photodiode E, resulting in positive (+) tracking signal output. On the other hand, when the track is shifted to the right (Fig. 5-C), the amount of light received by the photodiode F increases, resulting in negative (-) tracking signal output. And these extreme signals are detected as tracking error signals.

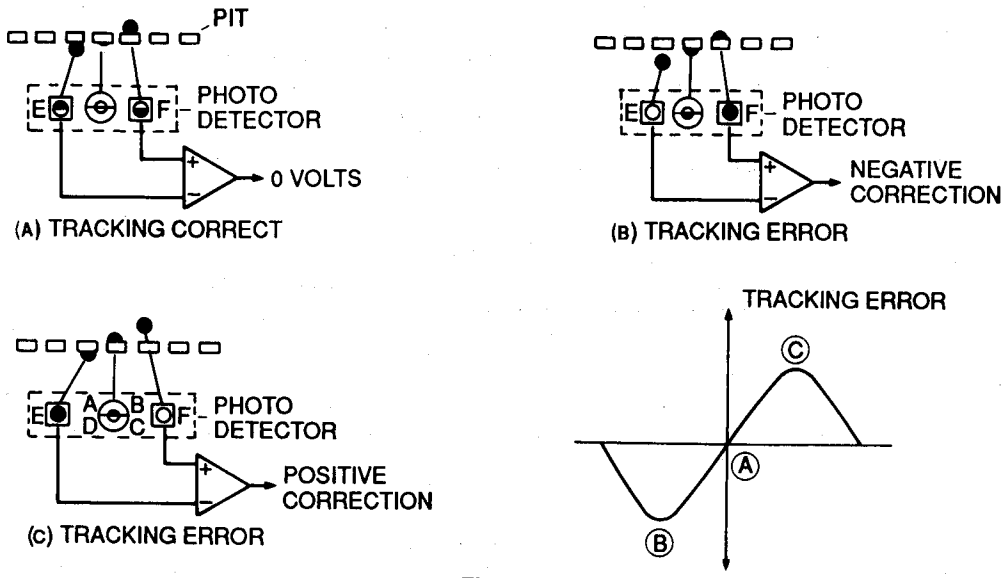


Fig. 5

2-5. Tracking servo control operation

When a tracking error signal is detected by photodiodes E and F, it is fed to pins 11 and 10 of IC101 respectively as shown in Fig. 6. In IC101, the signal is converted into voltage by the E I-V amplifier and F I-V amplifier, transmitted to the tracking error amplifier and output through pin 20. While it passes through IC102, in from pin 3 and out from pin 28, and IC103, in from pin 6 and out from 4, it is amplified in each IC and sent to the tracking coil to adjust pickup so that the amount of track shift is reduced as closely to none as possible.

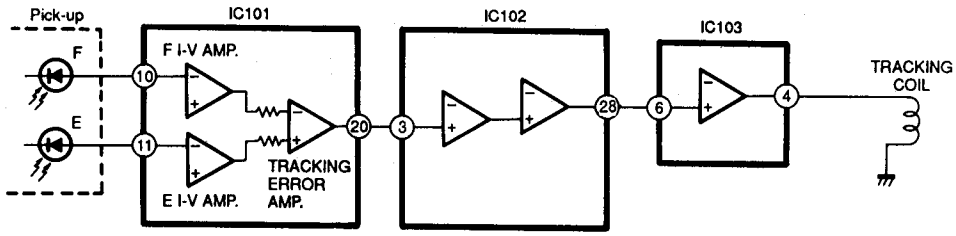


Fig. 6

3. Regenerative Circuit

3-1. RF circuit

The currents from photodiodes (a, b, c and d) are fed to IC101 through pins 7 and 8 and converted to voltage by RF I-V amplifiers (1) and (2) respectively there, added by the RF summing amplifier and output from pin 2 as a signal. As it is sent to pin 17 of IC201, it can be checked at the test point (TP202) provided on its way by means of the eye pattern check.

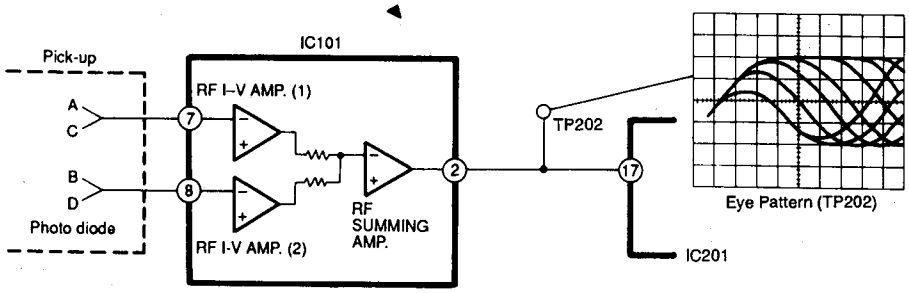


Fig. 7

3-2. EFM demodulation, error correction, serial/parallel conversion

EFM demodulation, error correction, digital filtering and serial/parallel conversion are performed by the internal circuitry of IC201. The eye-pattern signals from pin 2 of IC101 are sent to pin 17 of IC201, then demodulated from 14 bits to 8 bits by EFM readjustment. At the same time any error, if found, is corrected (CIRC) and the signals are sent to the D/A converter interface. After that, they are output from pins 72 and 74 of IC201 and fed to the RLS (Real-Time Linear Smoothing) module.

Also, deglitch pulse signals are output from D/A converter interface of IC201 (through pins 79 and 80). After their levels are shifted in the deglitcher circuit consisting of Q651, Q652, Q653 and Q654, they are sent to IC611.

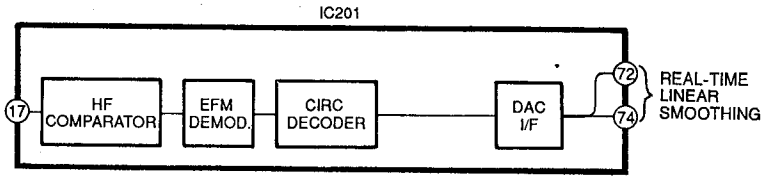


Fig. 8

4. REAL-TIME SMOOTHING MODULE

The output of pins 72 and 74 of IC201 drives the IC601 Hex Inverter and the IC602 8-bit shift register. IC601 and IC602 drives IC603–IC608. The signals from IC602 drives IC610 directly, and passes through IC603–IC608 before driving IC609. This results in the timing of the signal to pin 7 of IC610 being ahead of the signal to pin 7 of IC609. IC609 and IC610 are 18 bit linear D/A converters operating on the R-2 R, or ResistorLadder, Principle. The signals from pin 10 of IC609 and IC610 are sent to the Comparator/Integrator and Summing Amplifier.

The deglitch pulse signal outputs from the APTR (pin 80) and APTL (pin 79) terminals of DSP IC201 are added to the bases of Q651 (left channel) and Q652 (right channel) respectively. Q651 and Q652 are switching transistors which are turned on when biased in the forward direction. When Q651 and Q652 are turned on, Q653 and Q654 are also turned on, and the collectors of these latter two are connected to +V. As they are connected to -V through R659 and R660, a deglitch pulse signal which has been level shifted here is input to the control terminals (pin 6, 12 and pin 5, 13) of IC611. This signal turns the analog switch of IC611 on and off, so that the sampling and hold operations are carried out. C613 thru C616 are capacitors for hold operation.

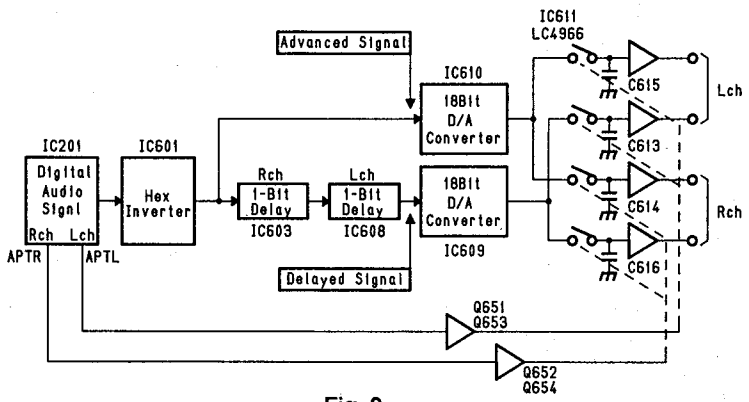


Fig. 9

5. AUDIO CIRCUIT

5-1. Comparator/Integrator and Summing Amplifier.

Dual-Differential circuits comprising of Q301, Q303, Q305, Q307, Q309, Q311, Q313, Q315, Q317 and Q319 with capacitor C311, smoothes out the time difference between IC609 and IC610. The signal is then fed through R349 to the final buffer circuit, Q321 and Q325 (for the left channel). Also Dual-Differential circuits comprising of Q302, Q304, Q306, Q308, Q310, Q312, Q314, Q316, Q318 and Q320 with capacitor C312, smoothes out the time difference between IC609 and IC610. The signal is then fed through R350 to the final buffer circuit, Q322 and Q326 (for the right channel). If needed, de-emphasis is applied by turning on Q327 (for the left channel) and Q328 (for the right channel).

5-2. Output Amplifier

The left output jacks are driven by an amplifier comprised of Q321 and Q333. The right output jacks are driven by an amplifier comprised of Q322 and Q334. Also Muting is provided by Q43, Q44, Q45 and Q46 (as shown by Fig. 10).

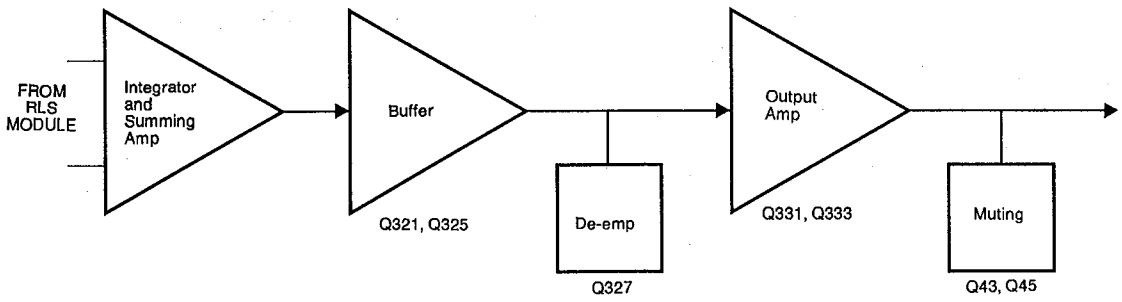
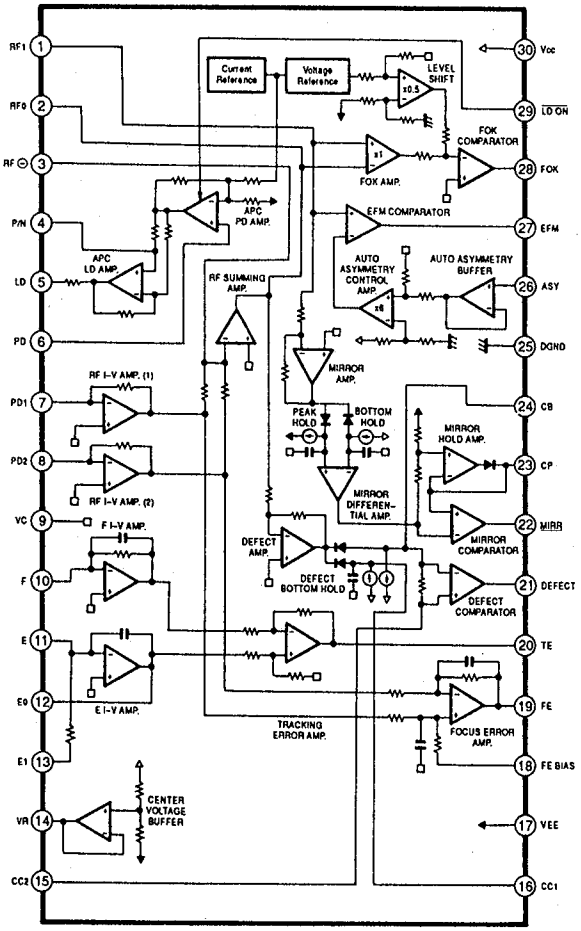


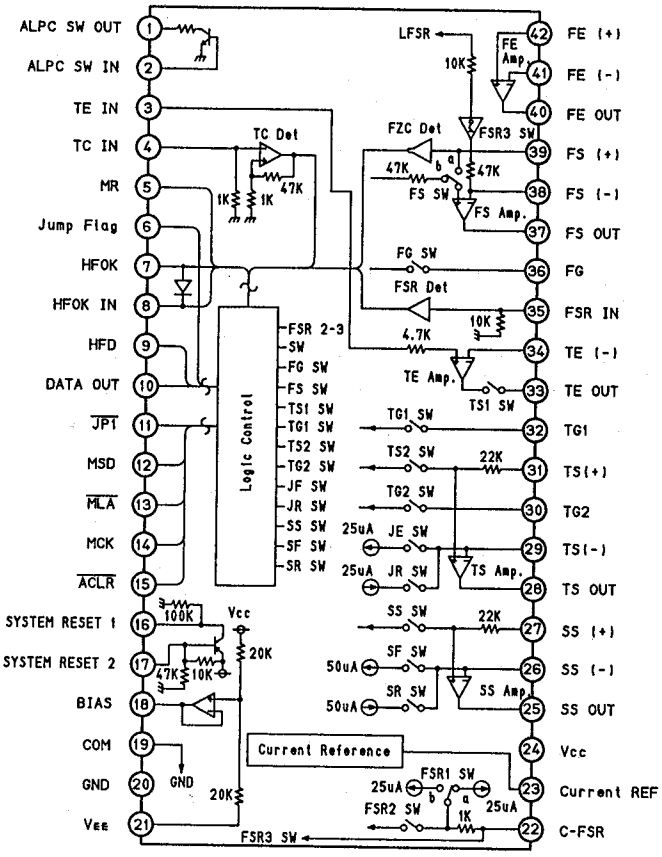
Fig. 10

IC BLOCK DIAGRAMS

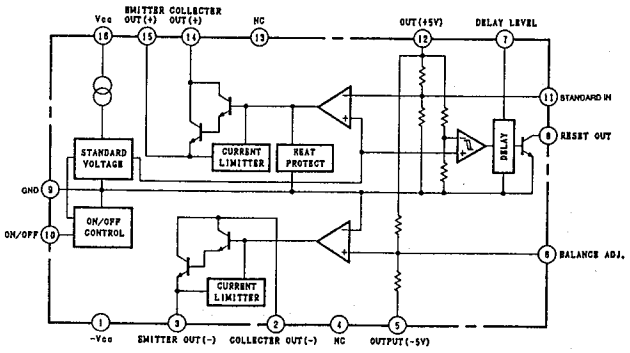
IC101 : CXA1081S
RF Amp.



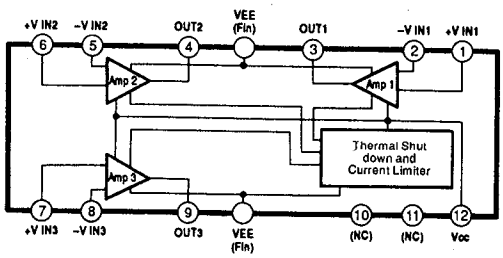
IC102 :
M51594AFP
Optical Pick-up Servo Control



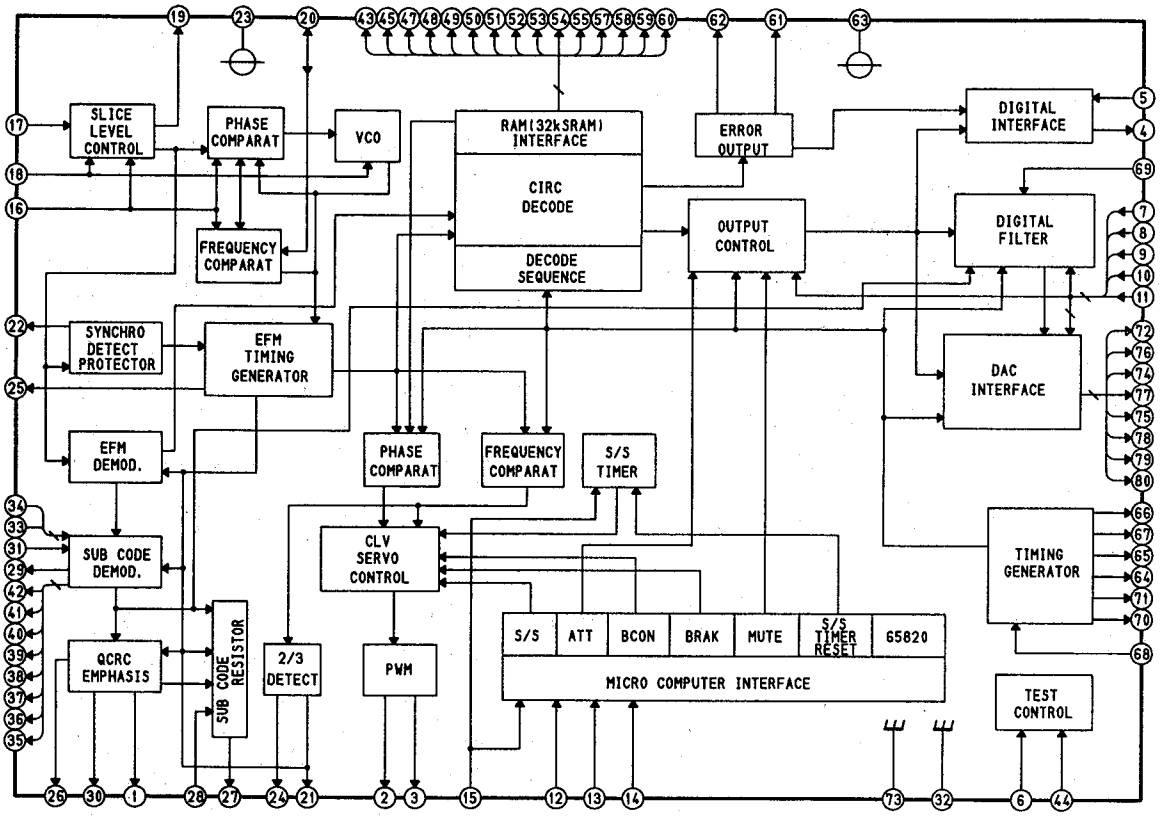
IC1 :
M5290P
Voltage Regulator



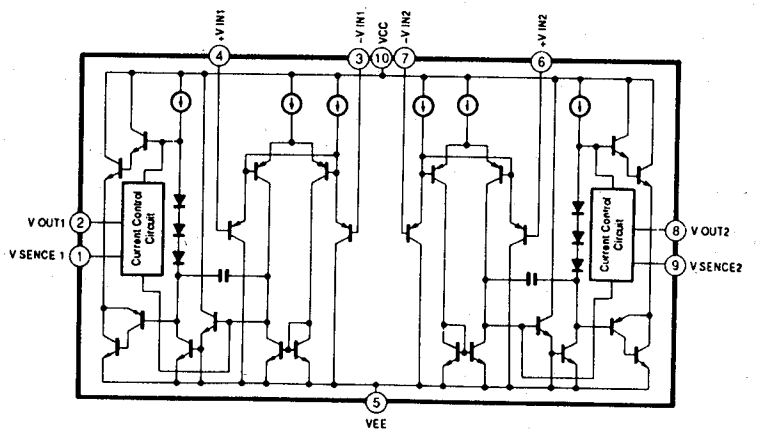
IC103 : LA6520
3 channel Power OP-Amp.



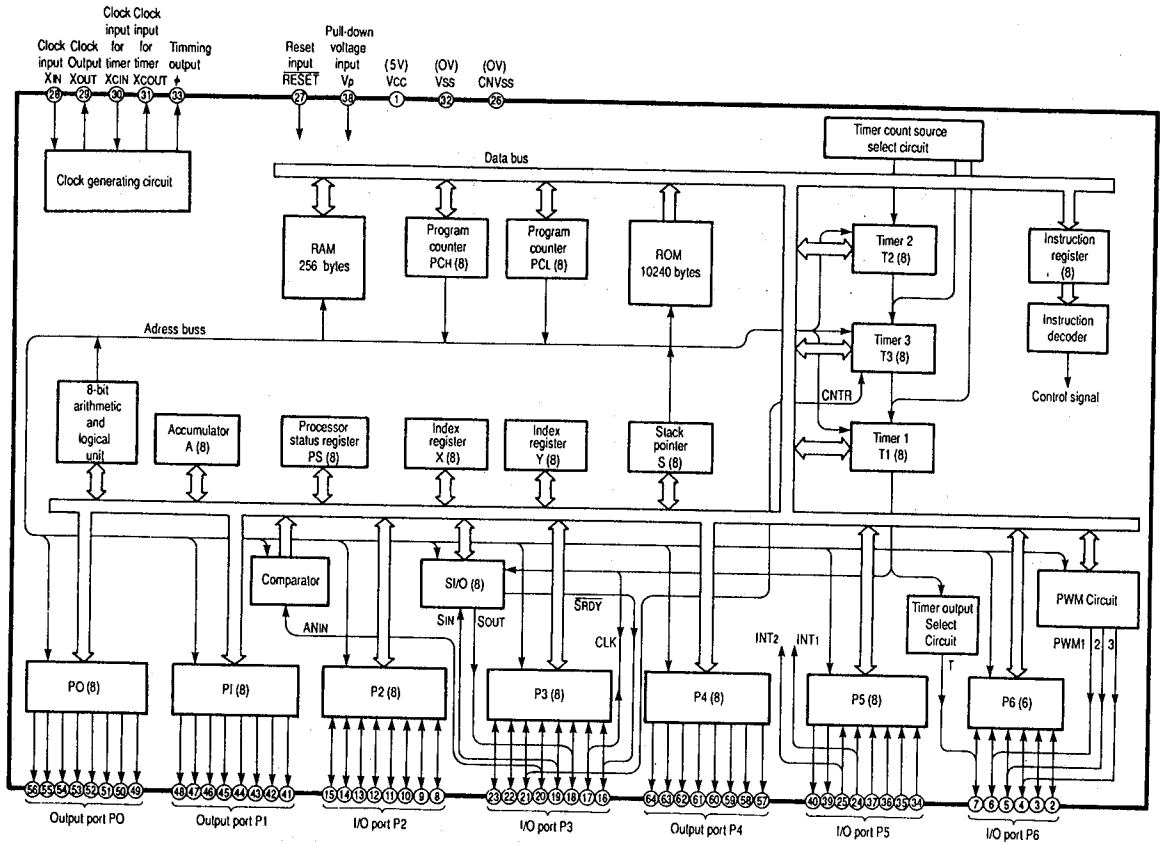
IC201 : M65820FP
Digital Signal Processor



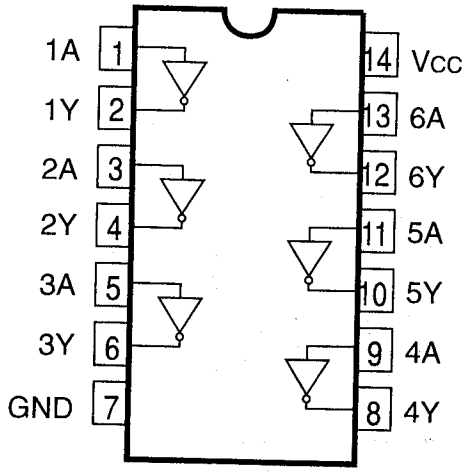
IC203 : LA6515
2 channel Power OP-Amp.



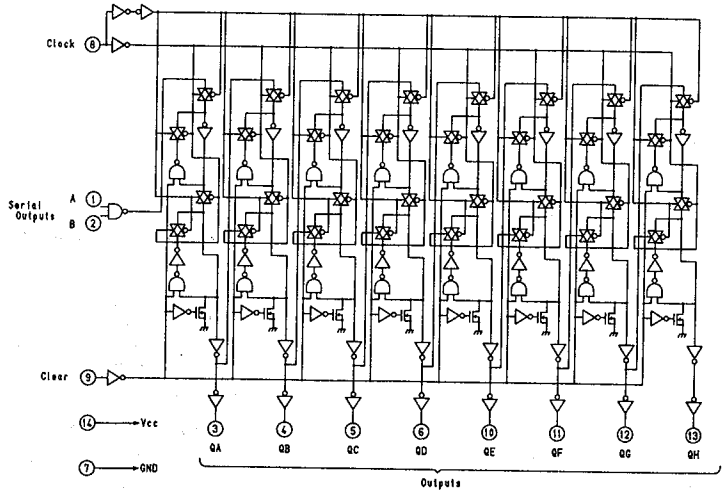
IC401 : M50957-243
Microcomputer



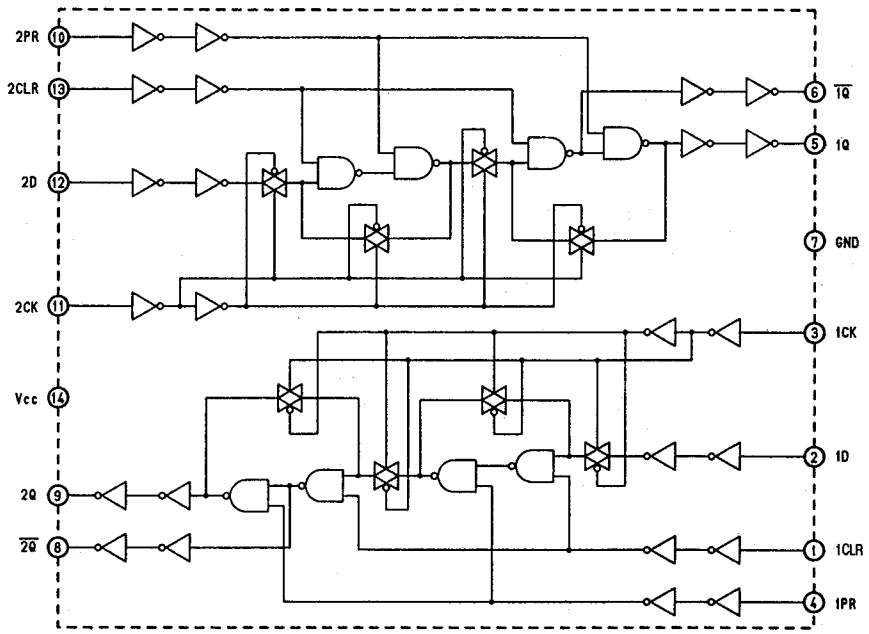
IC601 : HD74HC04FP
Hex Inverter



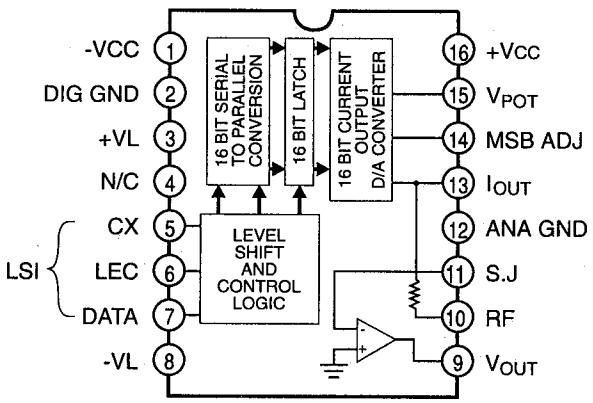
IC602-607 : HD74HC164FP
8-bit Shift Register



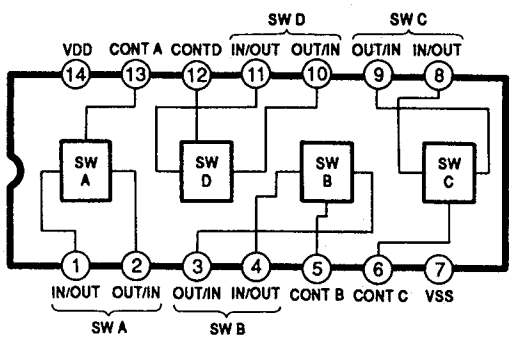
IC608 : HD74HC74FP
Hex Inverter



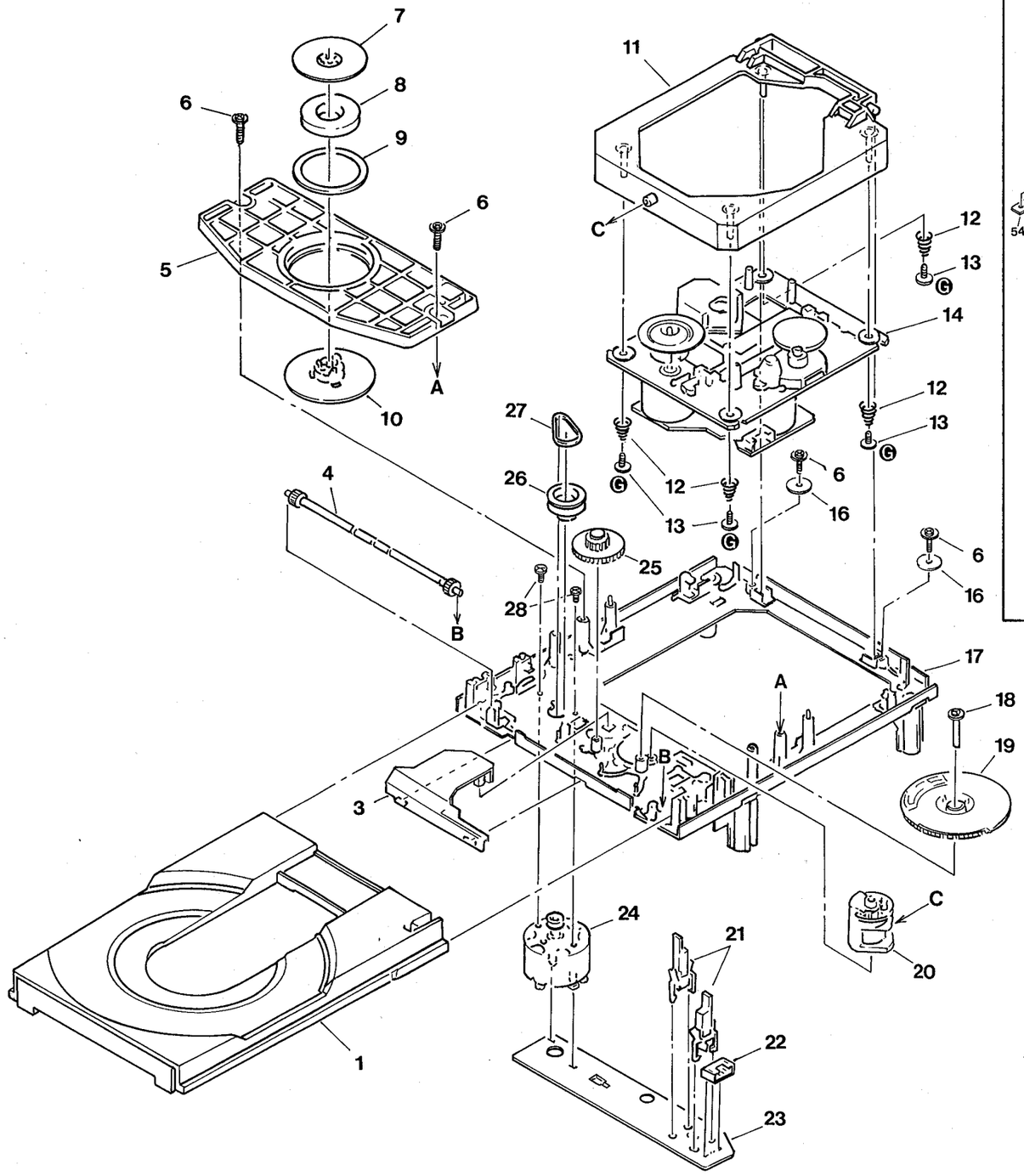
IC609, 610 : PCM61P
D/A Converter

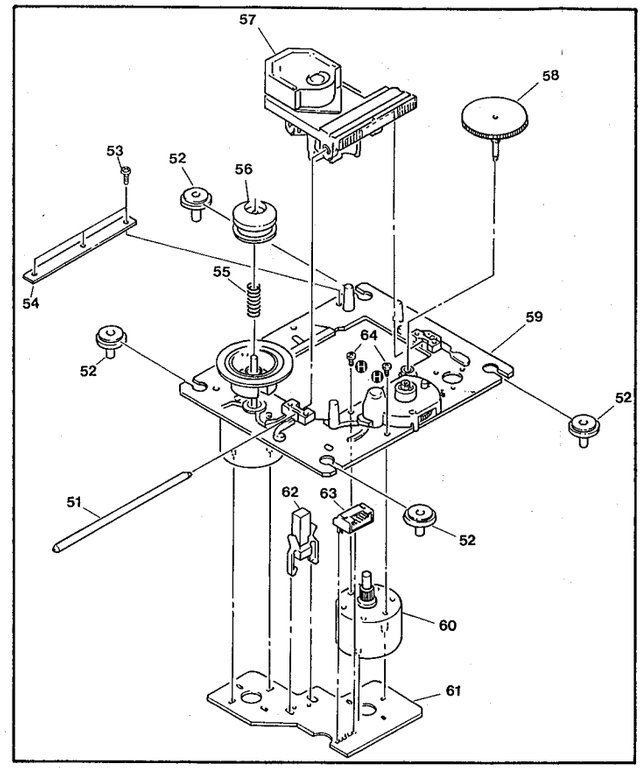


IC611 : LC4966
Sample and Hold



CD MECHANISM
EXPLODED VIEW

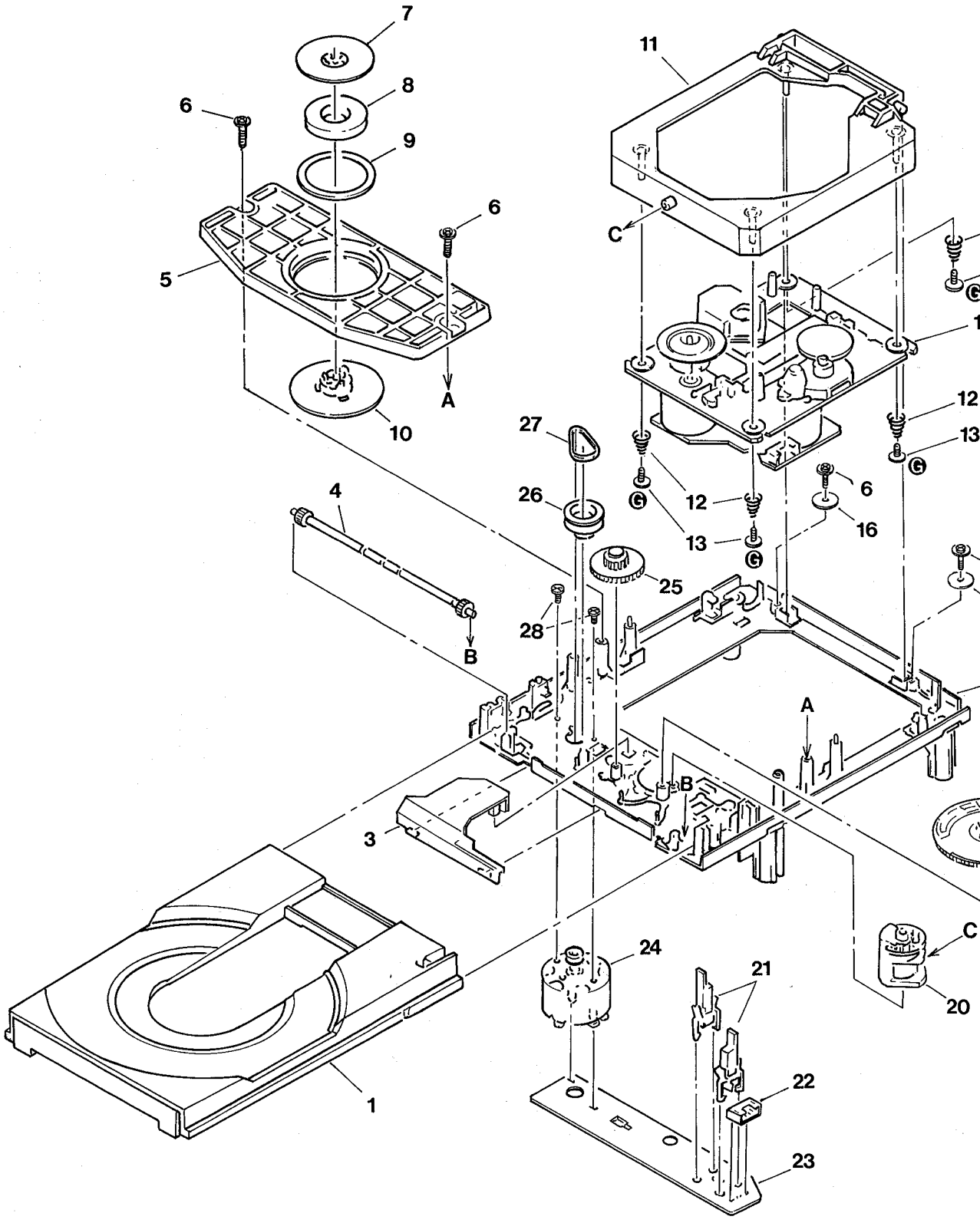


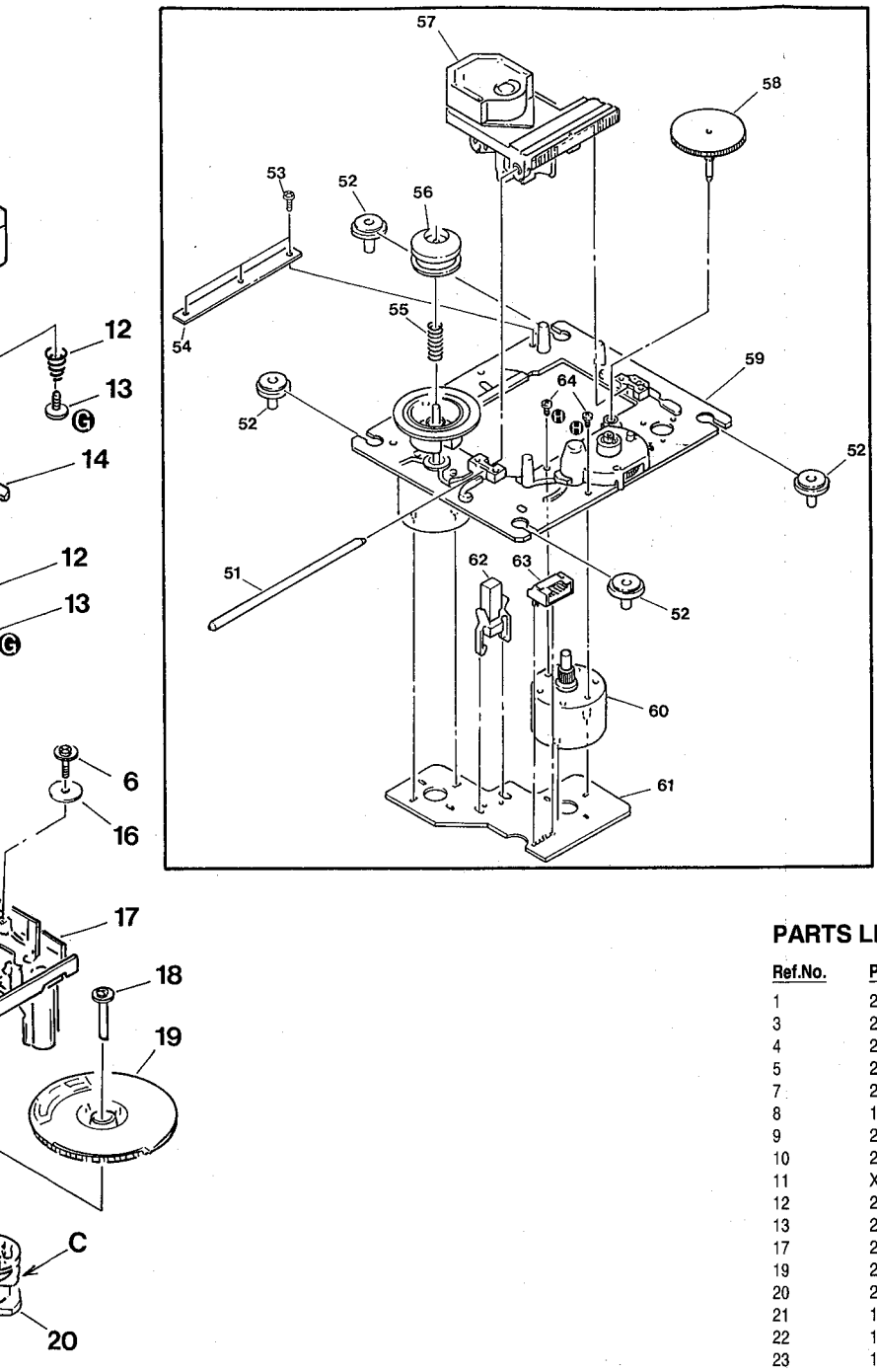


PARTS LIST

Ref.No.	Part No.	Description
1	2-625-550-02	TRAY (G)
3	2-625-544-01	COVER (G), GEAR
4	2-625-535-01	GEAR (G), TRAY
5	2-625-546-01	PLATE (G), CHUCKING
7	2-625-537-01	YOKE (S), CHUCKING
8	1-452-493-21	MAGNET
9	2-625-541-02	DAMPER (S)
10	2-625-548-01	PULLEY (G), CHUCKING
11	X-2625-227-1	CHASSIS A'SSY (G), SUB
12	2-625-539-01	SPRING (S) (X4)
13	2-625-730-01	WASHER BASED SCREW (X4)
17	2-625-552-06	CHASSIS (G), OUTSERT MAIN
19	2-625-547-01	GEAR (G), DRIVE
20	2-625-545-04	CAM (G), CONTROL
21	1-572-086-11	SWITCH, LEAF (X2)
22	1-564-721-11	PIN, CONNECTOR 5P
23	1-640-523-11	PC BOARD, LOADING
24	X-2625-117-1	MOTOR A'SSY, LOADING
25	2-625-534-02	GEAR (G), MIDWAY
26	2-625-536-02	PULLEY (G), LOADING
27	3-653-387-00	BELT, LM
51	4-917-565-01	SHAFT (S), SLED
52	2-625-538-01	INSULATOR (S) (X4)
53	2-641-386-01	SCREW (2x5mm), TAPPING (S) (X3)
55	2-625-191-01	SPRING (S), COMPRESSION
56	2-625-477-01	RING (LO) (S), CENTER
57	8-848-127-11	PICK UP KSS-210A (S) (RP)
58	2-625-188-02	GEAR (A) (S)
59	X-2625-133-1	CHASSIS A'SSY (MB), TT
60	X-2625-132-1	GEAR A'SSY (MB), MOTOR
61	1-639-678-12	PC BOARD, MOTOR (6P) (S)
62	1-572-085-11	SWITCH, LEAF
63	1-564-722-11	PIN, CONNECTOR 6P

CD MECHANISM
EXPLODED VIEW

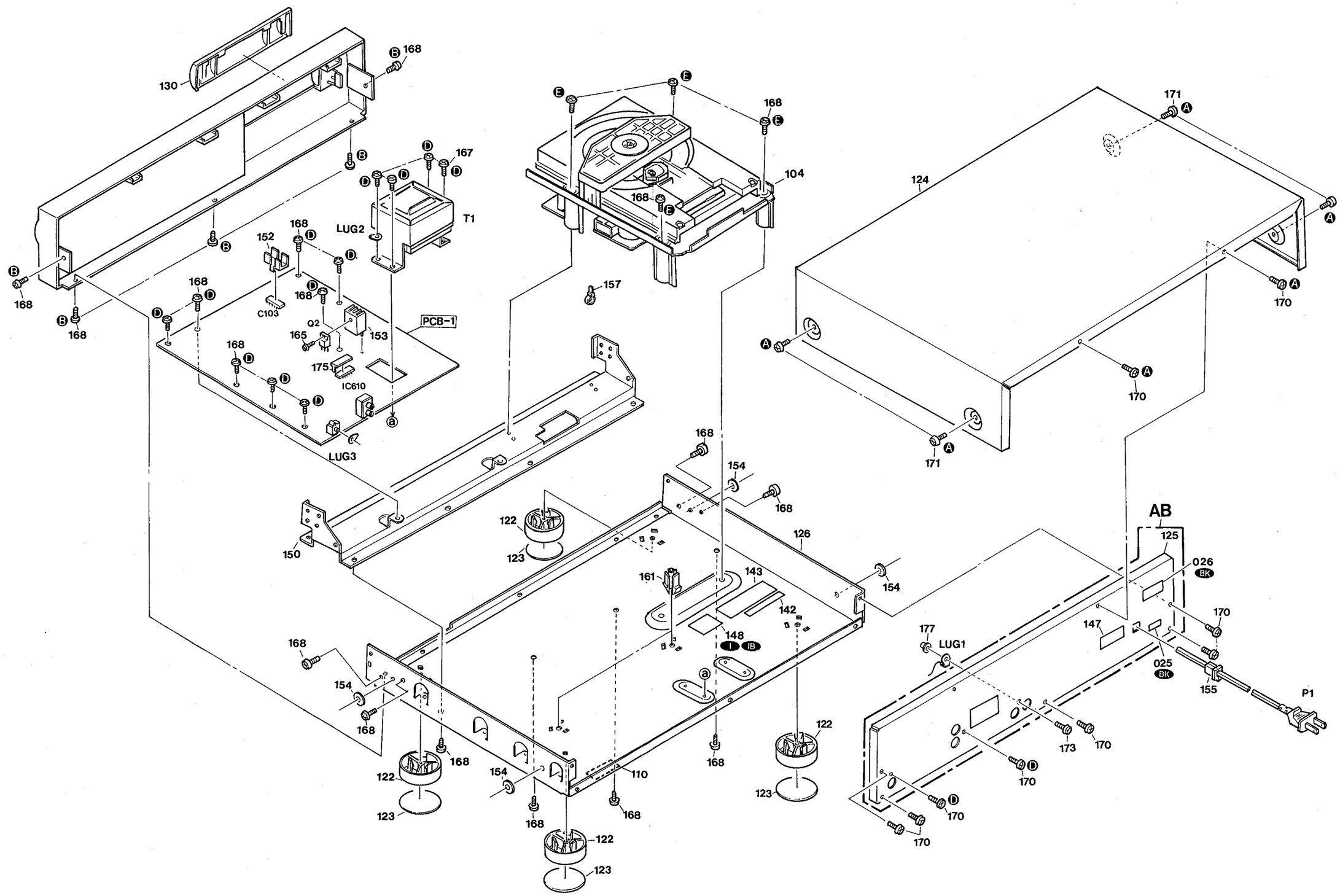




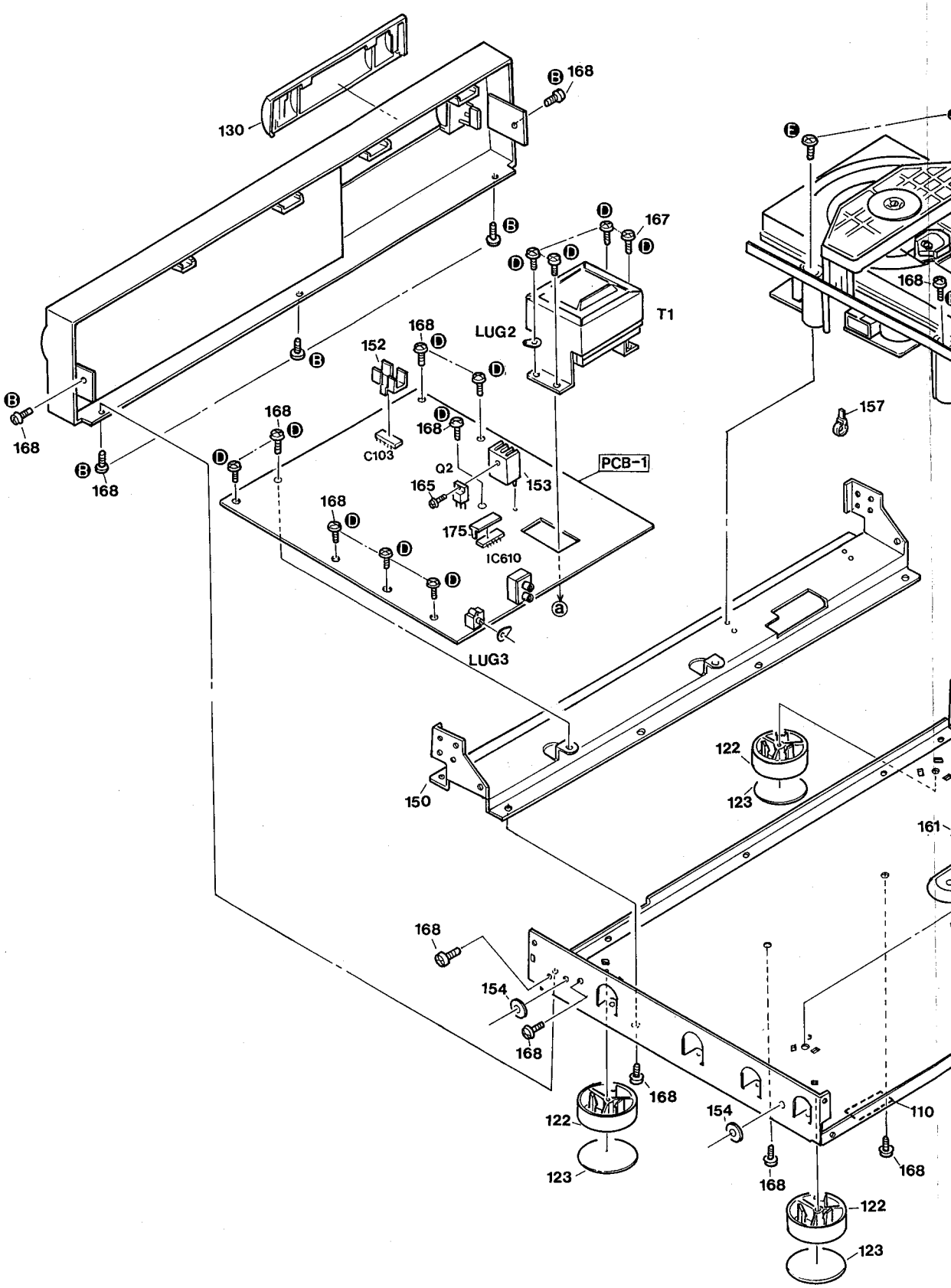
PARTS LIST

Ref.No.	Part No.	Description
1	2-625-550-02	TRAY (G)
3	2-625-544-01	COVER (G), GEAR
4	2-625-535-01	GEAR (G), TRAY
5	2-625-546-01	PLATE (G), CHUCKING
7	2-625-537-01	YOKE (S), CHUCKING
8	1-452-493-21	MAGNET
9	2-625-541-02	DAMPER (S)
10	2-625-548-01	PULLEY (G), CHUCKING
11	X-2625-227-1	CHASSIS A'SSY (G), SUB
12	2-625-539-01	SPRING (S) (X4)
13	2-625-730-01	WASHER BASED SCREW (X4)
17	2-625-552-06	CHASSIS (G), OUTSERT MAIN
19	2-625-547-01	GEAR (G), DRIVE
20	2-625-545-04	CAM (G), CONTROL
21	1-572-086-11	SWITCH, LEAF (X2)
22	1-564-721-11	PIN, CONNECTOR 5P
23	1-640-523-11	PC BOARD, LOADING
24	X-2625-117-1	MOTOR A'SSY, LOADING
25	2-625-534-02	GEAR (G), MIDWAY
26	2-625-536-02	PULLEY (G), LOADING
27	3-653-387-00	BELT, LM
51	4-917-565-01	SHAFT (S), SLED
52	2-625-538-01	INSULATOR (S) (X4)
53	2-641-386-01	SCREW (2x5mm), TAPPING (S) (X3)
55	2-625-191-01	SPRING (S), COMPRESSION
56	2-625-477-01	RING (LO) (S), CENTER
57	8-848-127-11	PICK UP KSS-210A (S) (RP)
58	2-625-188-02	GEAR (A) (S)
59	X-2625-133-1	CHASSIS A'SSY (MB), TT
60	X-2625-132-1	GEAR A'SSY (MB), MOTOR
61	1-639-678-12	PC BOARD, MOTOR (6P) (S)
62	1-572-085-11	SWITCH, LEAF
63	1-564-722-11	PIN, CONNECTOR 6P

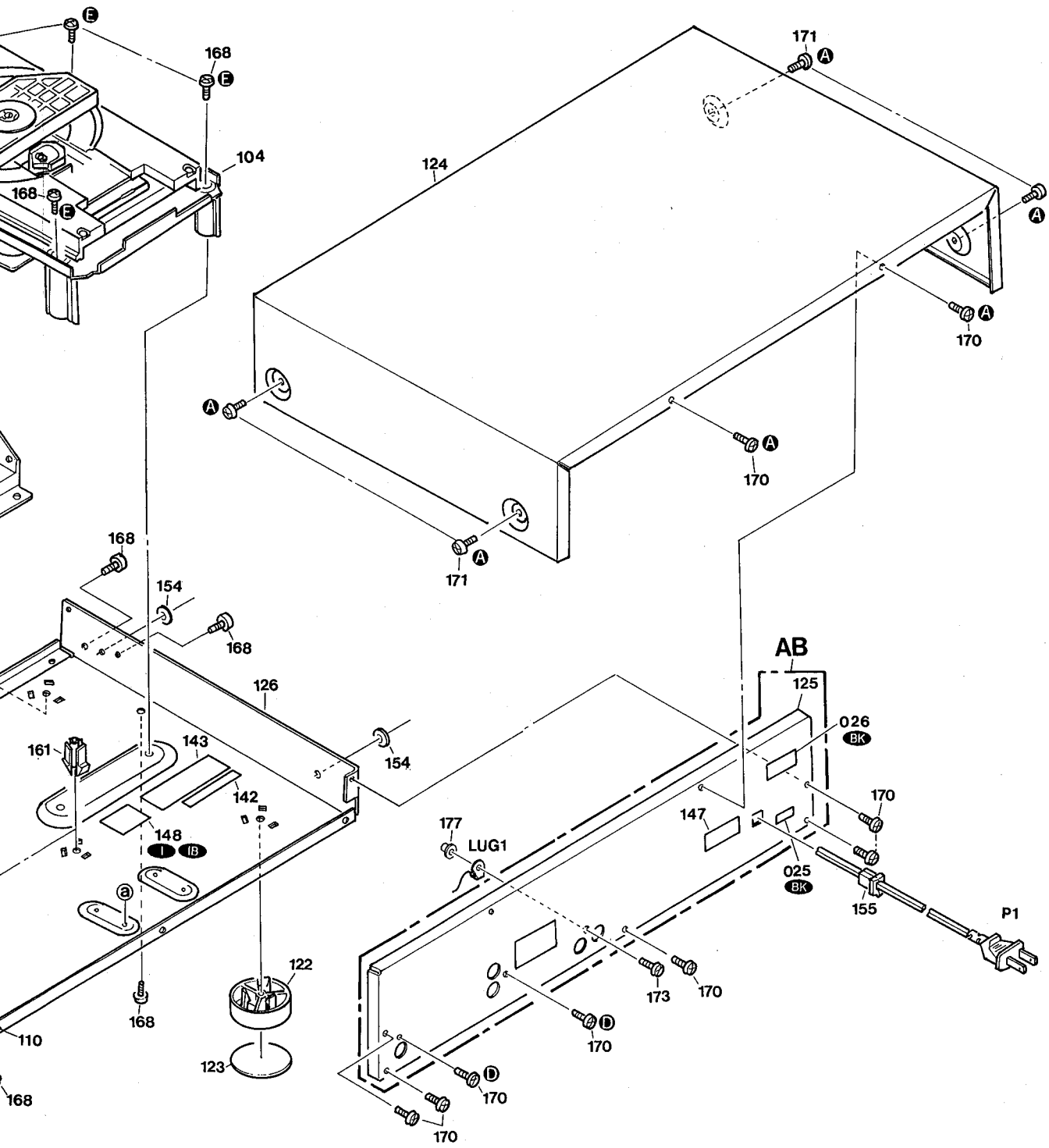
GENERAL UNIT
EXPLODED VIEW



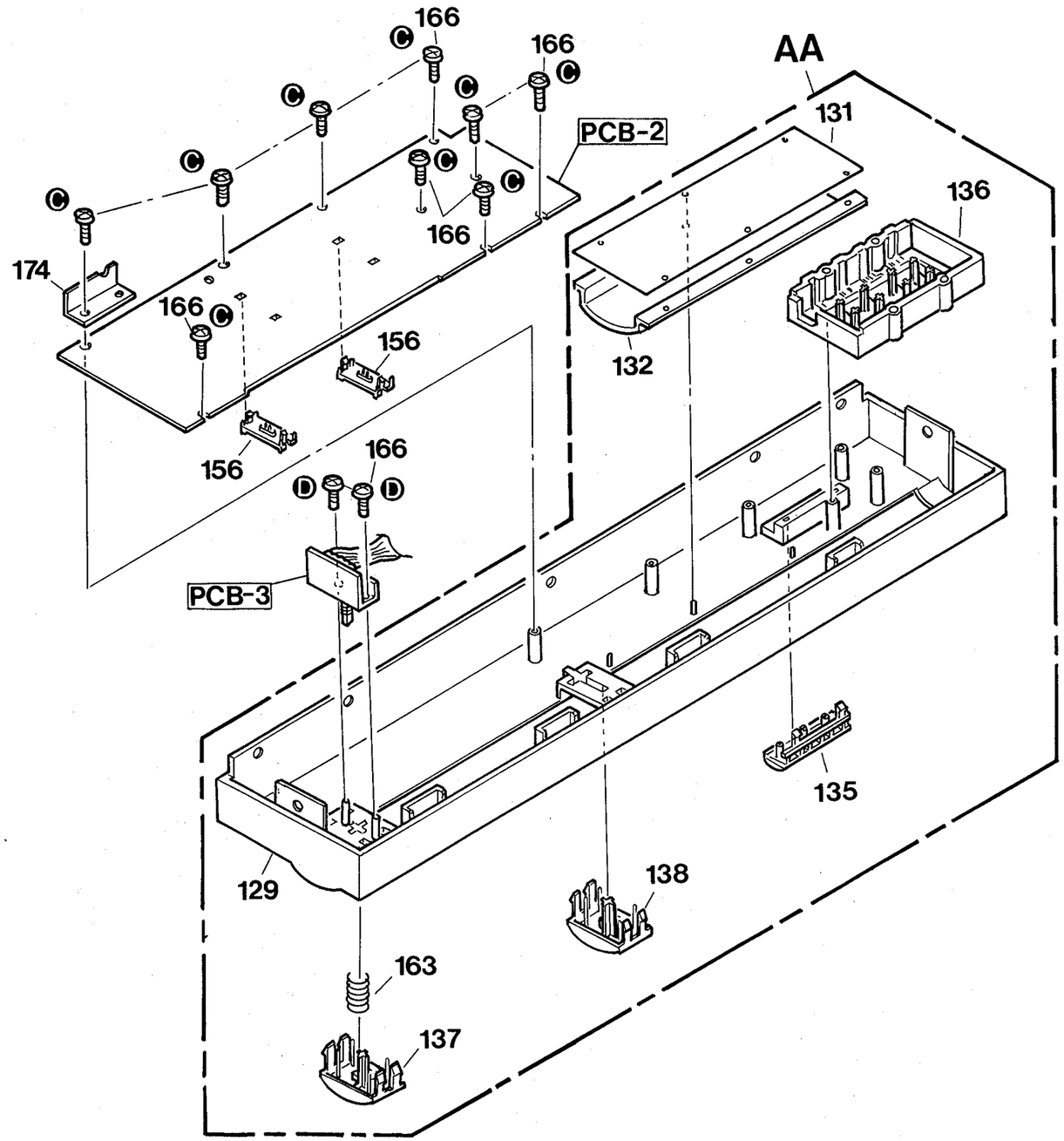
GENERAL UNIT
EXPLODED VIEW



F	G	H	I	J


E
168
E
104
168
E
171
A
124
A
170
A
A
170
171
168
154
168
126
161
143
142
154
148
I
IB
a
168
110
168
122
123
AB
125
026
BK
170
147
177
LUG1
025
BK
155
P1
173
170
D
170
D
170
170

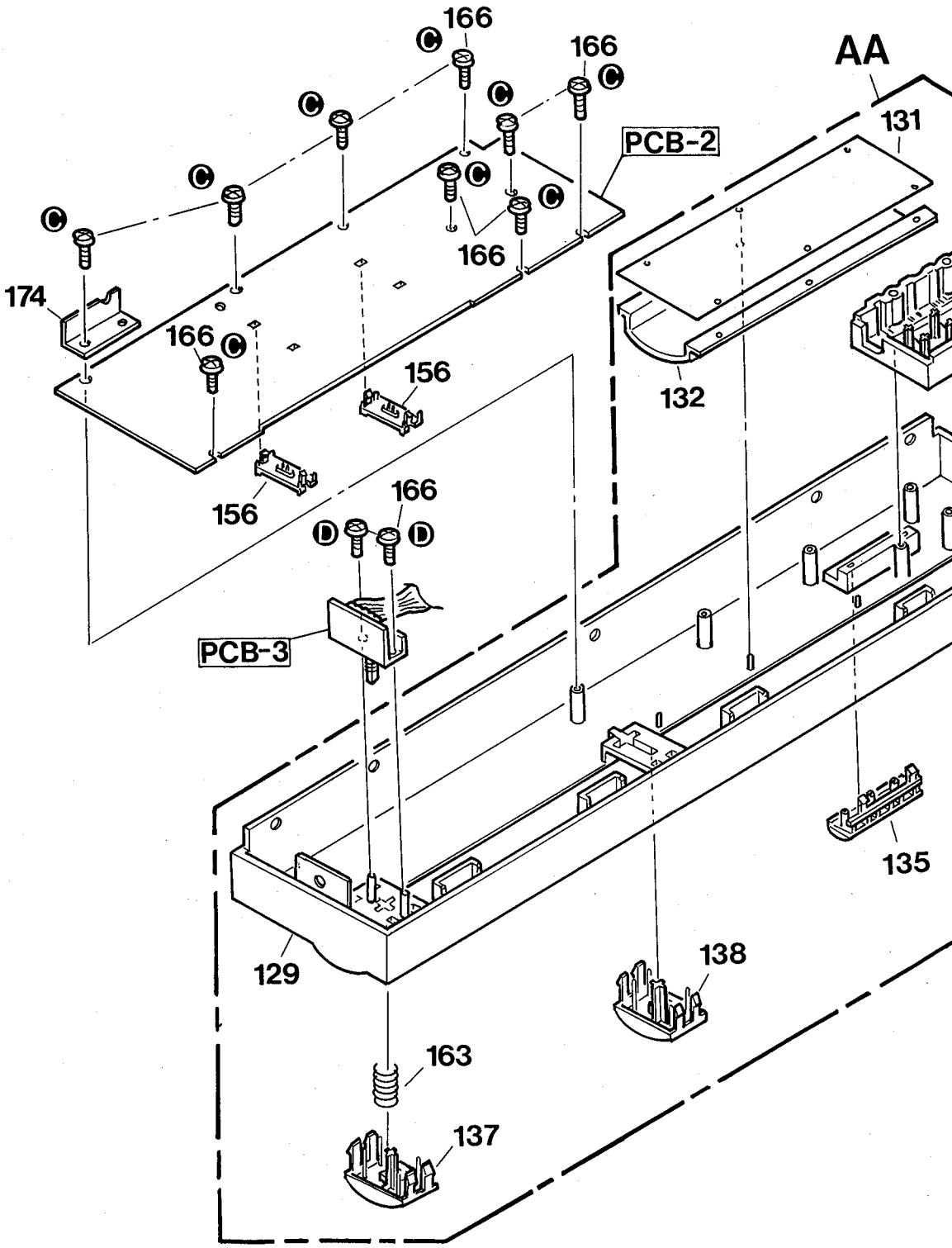
GENERAL UNIT
EXPLODED VIEW



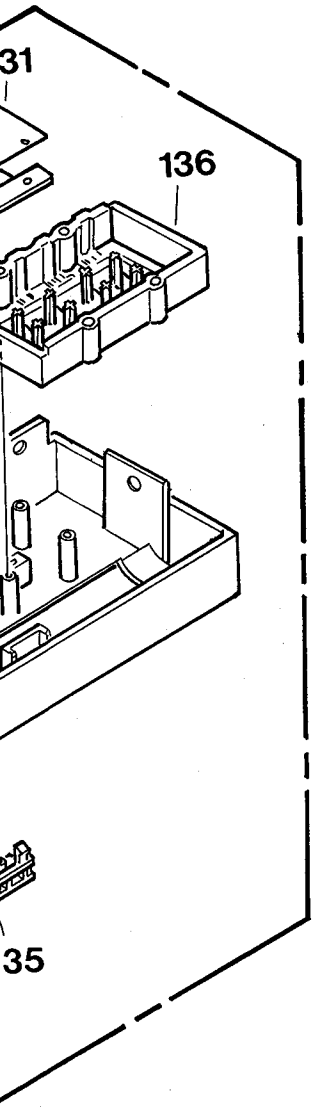
GENERAL UNIT PARTS LIST

Ref.No.	Part No.	Description
AA	A442-HD7425A	FRONT PANEL ASSEMBLY (BK) (IB)
AA	A442-HD7425B	FRONT PANEL ASSEMBLY (I)
AB	A424-HD7425B	CABINET BACK ASSEMBLY (BK)
AB	A424-HD7425A	CABINET BACK ASSEMBLY (I) (IB)
025	1341-**568	NAME PLATE, PRODUCTION DATE (BK)
026	1756-CSA	LABEL, CSA LABEL (BK)
⚠ 104	3119-02301	CD MECHA ASSEMBLY
110	1117-78	SERIAL LABEL, CABINET BUTTOM
122	1319-04302	LEG (X4)
123	1319-04601	LEG, RUBBER (X4)
124	1414-17001	CABINET, TOP COVER
125	1424-36403	CABINET BACK, REAR (BK)
125	1424-36404	CABINET BACK, REAR (I) (IB)
126	1424-36301	CABINET BACK, BOTTOM
129	1442-28504	FRONT PANEL (BK) (IB)
129	1442-28503	FRONT PANEL (I)
130	1452-10002	LID, CD MECHA (BK) (IB)
130	1452-10001	LID, CD MECHA (I)
131	1511-19810	PANEL, FL FILTER
132	1532-17507	WINDOW, FRONT
135	1662-68202	PUSH BUTTON, DISPLAY/PROGRAM/TIME (BK) (IB)
135	1662-68201	PUSH BUTTON, DISPLAY/PROGRAM/TIME (I)
136	1662-52404	PUSH BUTTON, PLAY/PAUSE/STOP/ REPEAT/SKIP(F,R)/SEARCH(F,R) (BK) (IB)
136	1662-52403	PUSH BUTTON, PLAY/PAUSE/STOP/ REPEAT/SKIP(F,R)/SEARCH(F,R) (I)
137	1662-52001	PUSH BUTTON, POWER (BK) (IB)
137	1662-52003	PUSH BUTTON, POWER (I)
138	1662-52002	PUSH BUTTON, OPEN/CLOSE (BK) (IB)
138	1662-52004	PUSH BUTTON, OPEN/CLOSE (I)
142	1756-03305	LABEL, LASER CAUTION, CD MECHA
143	1756-09602	LABEL, LASER CAUTION, CD MECHA (BK)
143	1756-12101	LABEL, LASER CAUTION, CD MECHA (I) (IB)
147	1756-11801	LABEL, LASER PRODUCT, REAR
148	1756-11802	LABEL, LASER CAUTION, CD MECHA (I) (IB)
150	2219-8394	METAL FITTG, CD MECHA
152	2222-7264	HEAT SINK, IC103
153	2222-7217	HEAT SINK, Q2
154	2111-1389	FELT, CABINET BUTTOM (X4)
155	2240-364	HOLDER, AC CORD
156	2240-7370	HOLDER, FL401 (X2)
157	2240-R0101	HOLDER, WIRING (X2)
161	2360-7022	SPECIAL BOSS, MAIN PCB (X2)
163	2651-2101732	SPRING, POWER BUTTON
165	2327-R0130082	SCREW,BND+ (3X8 mm)
166	2347-R0126082	SCREW,BND T+ (2.6X8 mm) (X11)
167	2347-R0130062	SCREW,BND T+ (3X6 mm) (X4)
168	2347-R0130082	SCREW,BND T+ (3X8 mm) (X25)
170	2347-R0130084	SCREW,BND T+ (3X8 mm) (X9)
171	2347-R0140064	SCREW,BND T+ (4X6 mm) (X4)
173	2327-R0130064	SCREW,BND+ (3X6 mm)
174	2216-7187	SHIELD PLATE, FRONT PCB EARTH
175	2216-7181	SHIELD PLATE, IC610
177	2440-7016	SPECIAL NUT

GENERAL UNIT
EXPLODED VIEW



F G H I J

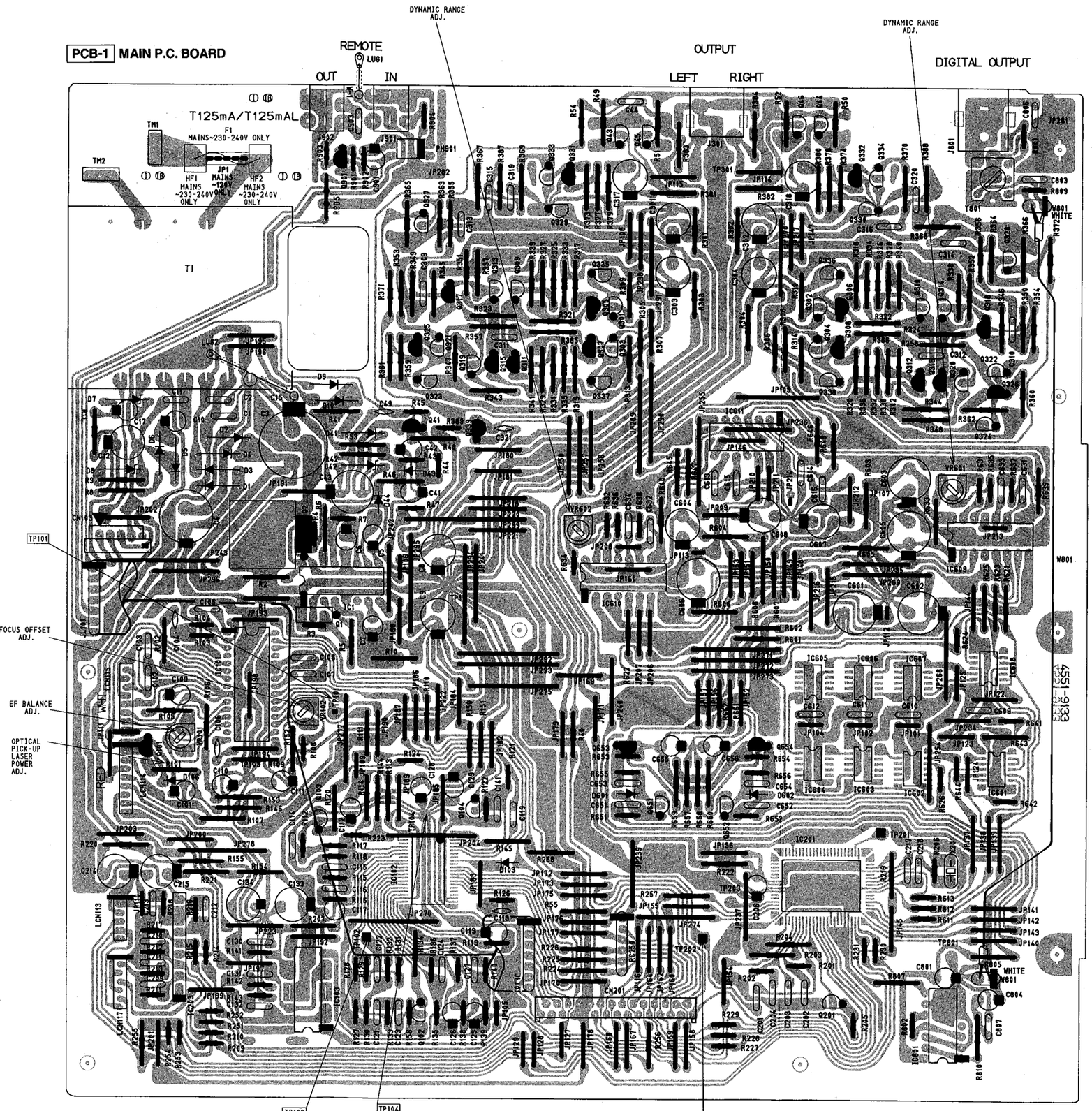


GENERAL UNIT PARTS LIST

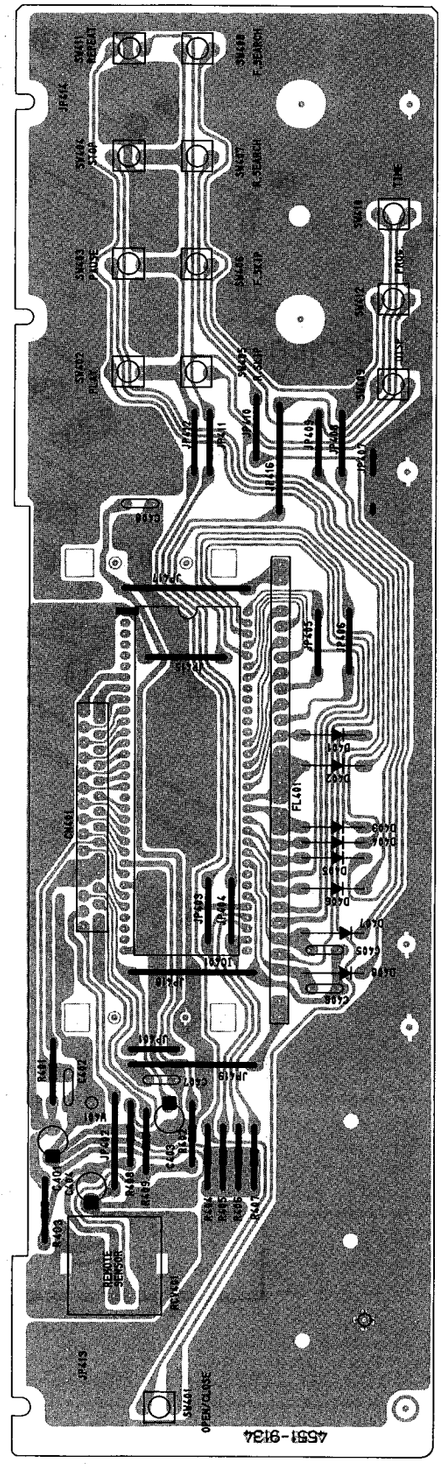
Ref.No.	Part No.	Description
AA	A442-HD7425A	FRONT PANEL ASSEMBLY BK IB
AA	A442-HD7425B	FRONT PANEL ASSEMBLY I
AB	A424-HD7425B	CABINET BACK ASSEMBLY BK
AB	A424-HD7425A	CABINET BACK ASSEMBLY I IB
025	1341-**568	NAME PLATE, PRODUCTION DATE BK
026	1756-CSA	LABEL, CSA LABEL BK
⚠ 104	3119-02301	CD MECHA ASSEMBLY
110	1117-78	SERIAL LABEL, CABINET BUTTOM
122	1319-04302	LEG (X4)
123	1319-04601	LEG, RUBBER (X4)
124	1414-17001	CABINET, TOP COVER
125	1424-36403	CABINET BACK, REAR BK
125	1424-36404	CABINET BACK, REAR I IB
126	1424-36301	CABINET BACK, BOTTOM
129	1442-28504	FRONT PANEL BK IB
129	1442-28503	FRONT PANEL I
130	1452-10002	LID, CD MECHA BK IB
130	1452-10001	LID, CD MECHA I
131	1511-19810	PANEL, FL FILTER
132	1532-17507	WINDOW, FRONT
135	1662-68202	PUSH BUTTON, DISPLAY/PROGRAM/TIME BK IB
135	1662-68201	PUSH BUTTON, DISPLAY/PROGRAM/TIME I
136	1662-52404	PUSH BUTTON, PLAY/PAUSE/STOP/ REPEAT/SKIP(F,R)/SEARCH(F,R) BK IB
136	1662-52403	PUSH BUTTON, PLAY/PAUSE/STOP/ REPEAT/SKIP(F,R)/SEARCH(F,R) I
137	1662-52001	PUSH BUTTON, POWER BK IB
137	1662-52003	PUSH BUTTON, POWER I
138	1662-52002	PUSH BUTTON, OPEN/CLOSE BK IB
138	1662-52004	PUSH BUTTON, OPEN/CLOSE I
142	1756-03305	LABEL, LASER CAUTION, CD MECHA
143	1756-09602	LABEL, LASER CAUTION, CD MECHA BK
143	1756-12101	LABEL, LASER CAUTION, CD MECHA I IB
147	1756-11801	LABEL, LASER PRODUCT, REAR
148	1756-11802	LABEL, LASER CAUTION, CD MECHA I IB
150	2219-8394	METAL FITTG, CD MECHA
152	2222-7264	HEAT SINK, IC103
153	2222-7217	HEAT SINK, Q2
154	2111-1389	FELT, CABINET BUTTOM (X4)
155	2240-364	HOLDER, AC CORD
156	2240-7370	HOLDER, FL401 (X2)
157	2240-R0101	HOLDER, WIRING (X2)
161	2360-7022	SPECIAL BOSS, MAIN PCB (X2)
163	2651-2101732	SPRING, POWER BUTTON
165	2327-R0130082	SCREW,BND+ (3X8 mm)
166	2347-R0126082	SCREW,BND T+ (2.6X8 mm) (X11)
167	2347-R0130062	SCREW,BND T+ (3X6 mm) (X4)
168	2347-R0130082	SCREW,BND T+ (3X8 mm) (X25)
170	2347-R0130084	SCREW,BND T+ (3X8 mm) (X9)
171	2347-R0140064	SCREW,BND T+ (4X6 mm) (X4)
173	2327-R0130064	SCREW,BND+ (3X6 mm)
174	2216-7187	SHIELD PLATE, FRONT PCB EARTH
175	2216-7181	SHIELD PLATE, IC610
177	2440-7016	SPECIAL NUT

P.C. BOARDS

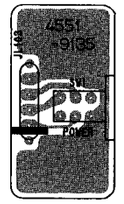
PCB-1 MAIN P.C. BOARD



PCB-2 FRONT P.C. BOARD

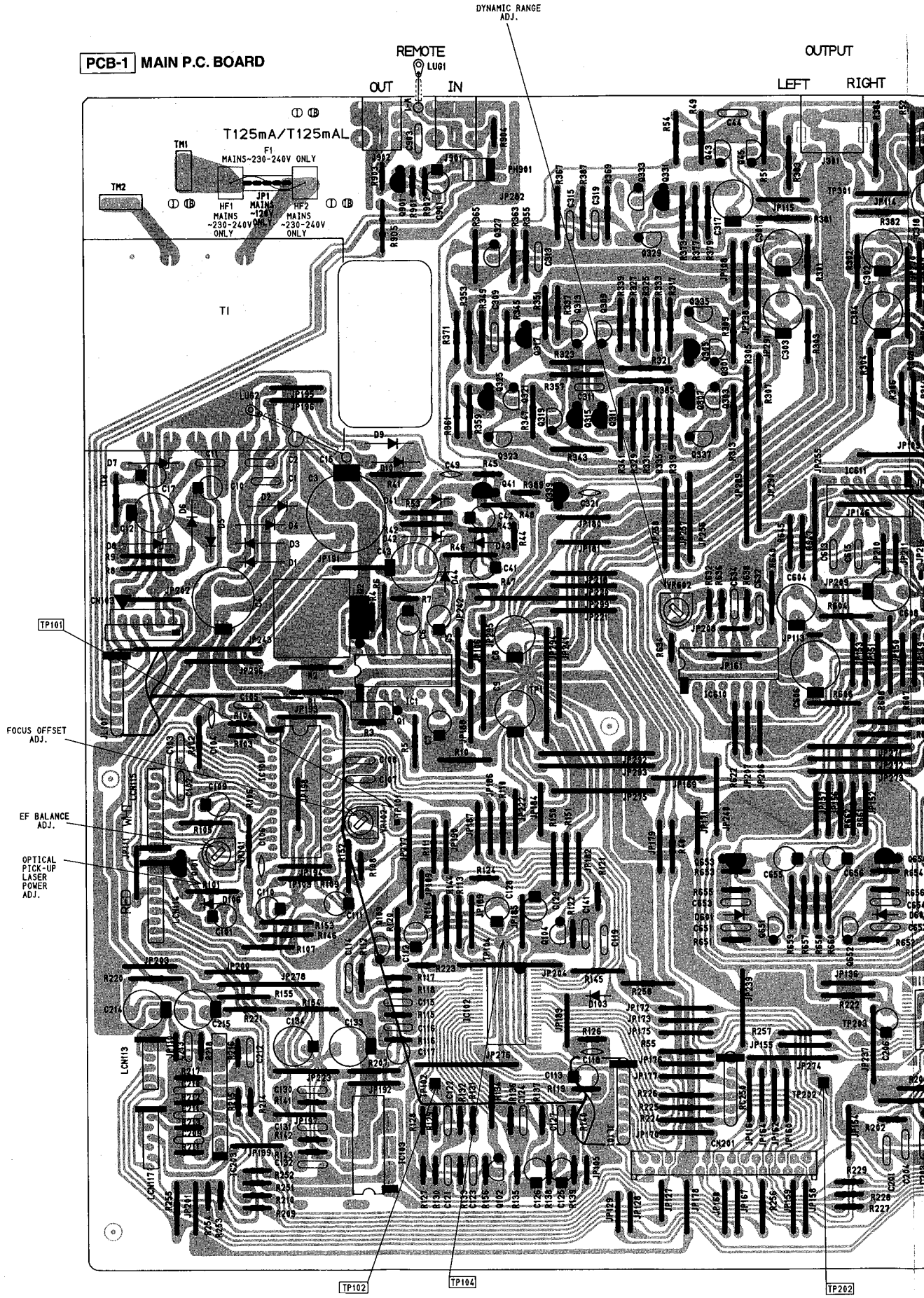


PCB-3 POWER SWITCH P. C. BOARD



P.C. BOARDS

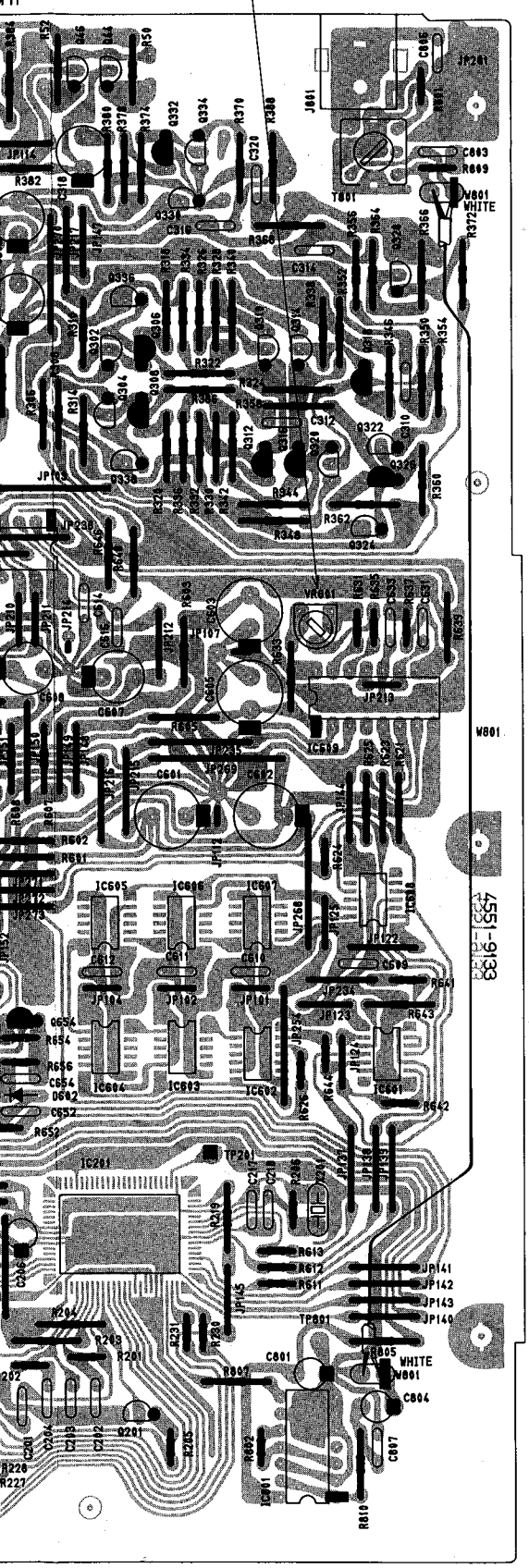
PCB-1 MAIN P.C. BOARD



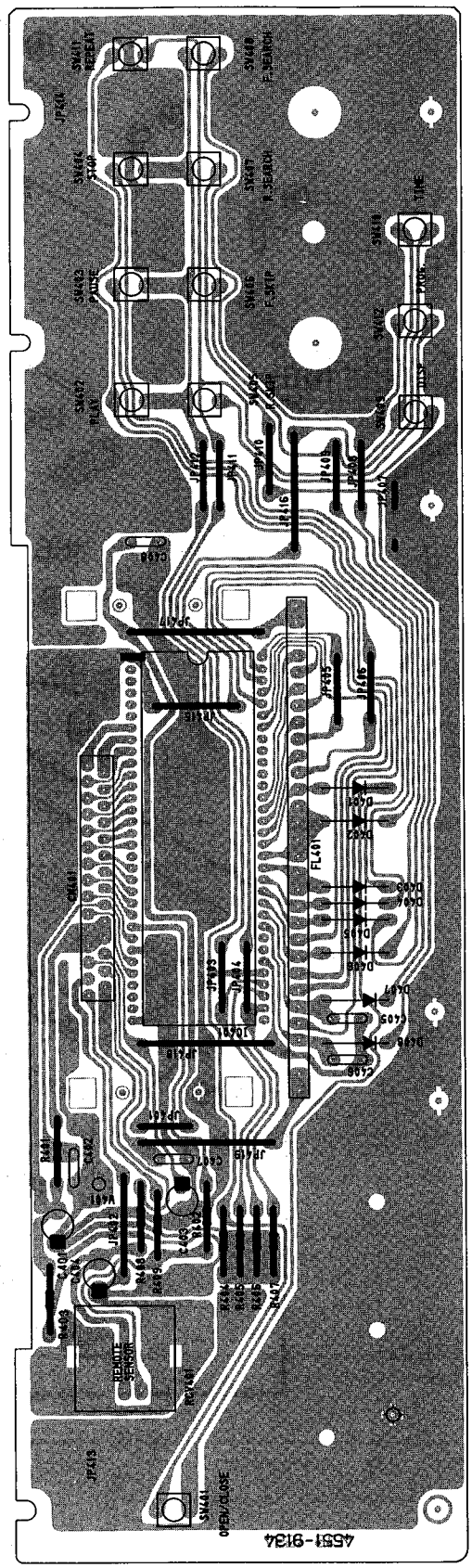
DYNAMIC RANGE ADJ.

DIGITAL OUTPUT

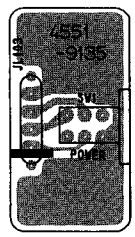
HT



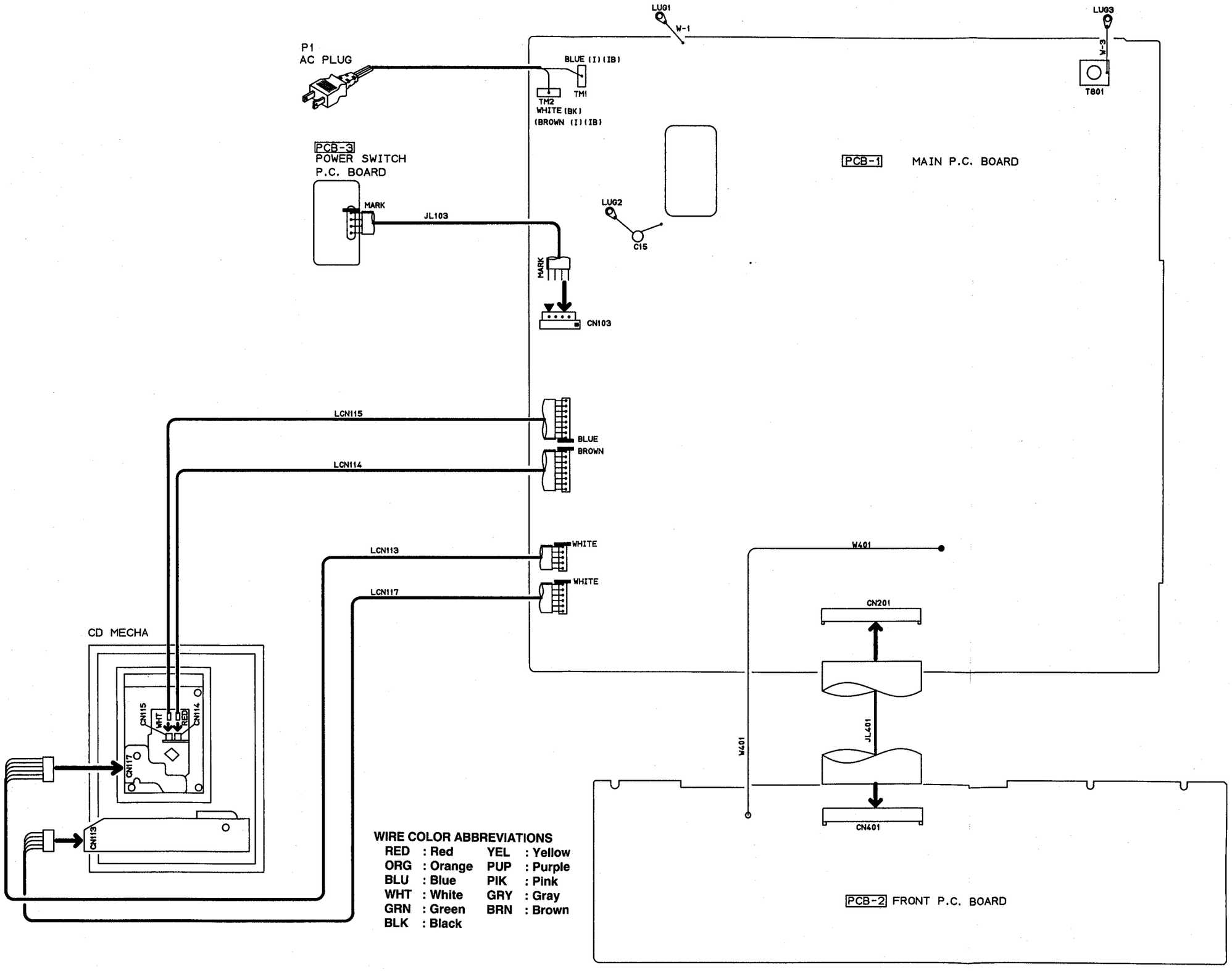
PCB-2 FRONT P.C. BOARD



PCB-3 POWER SWITCH P. C. BOARD



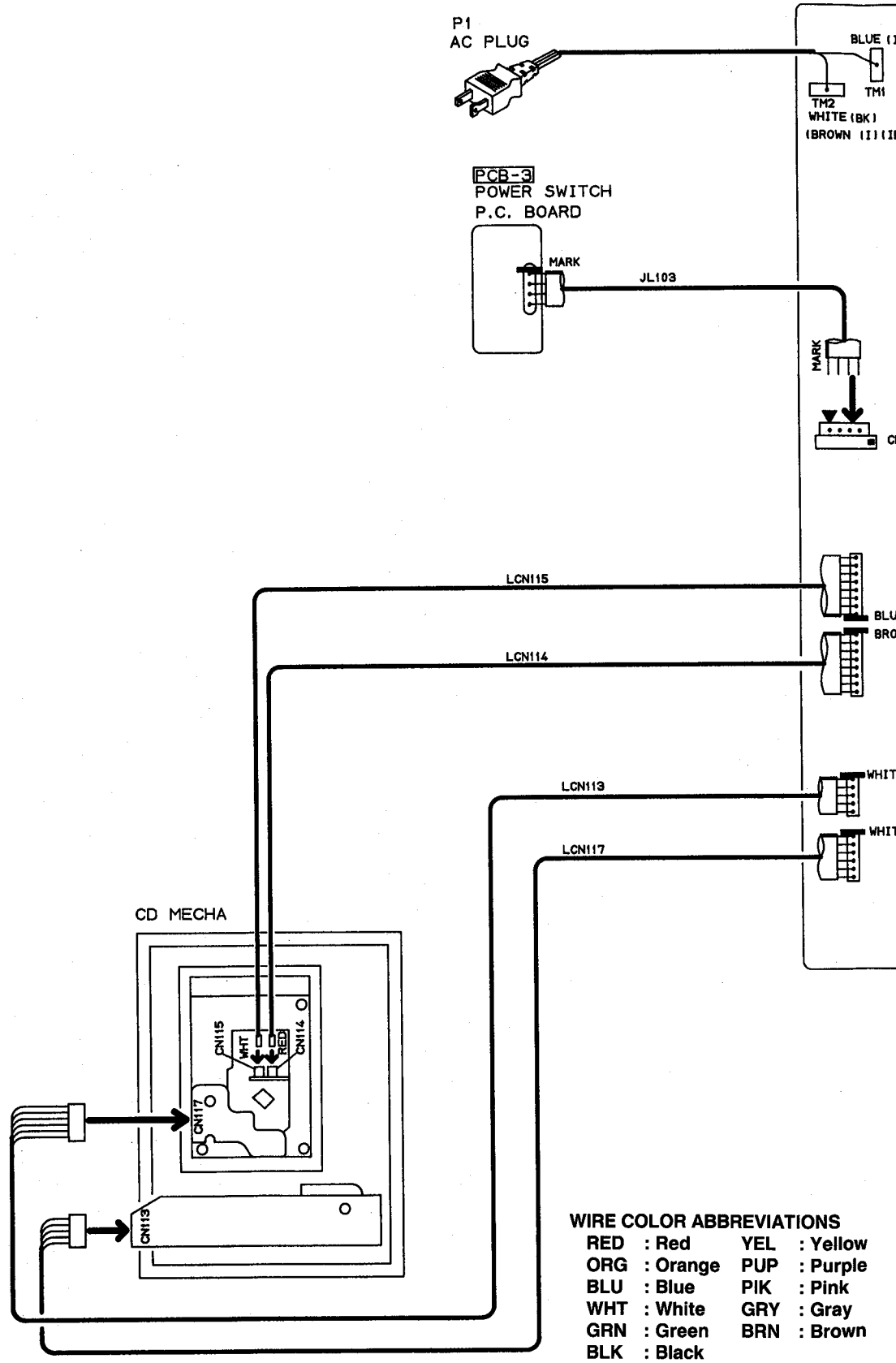
WIRING DIAGRAM



WIRE COLOR ABBREVIATIONS

RED	: Red	YEL	: Yellow
ORG	: Orange	PUP	: Purple
BLU	: Blue	PIK	: Pink
WHT	: White	GRY	: Gray
GRN	: Green	BRN	: Brown
BLK	: Black		

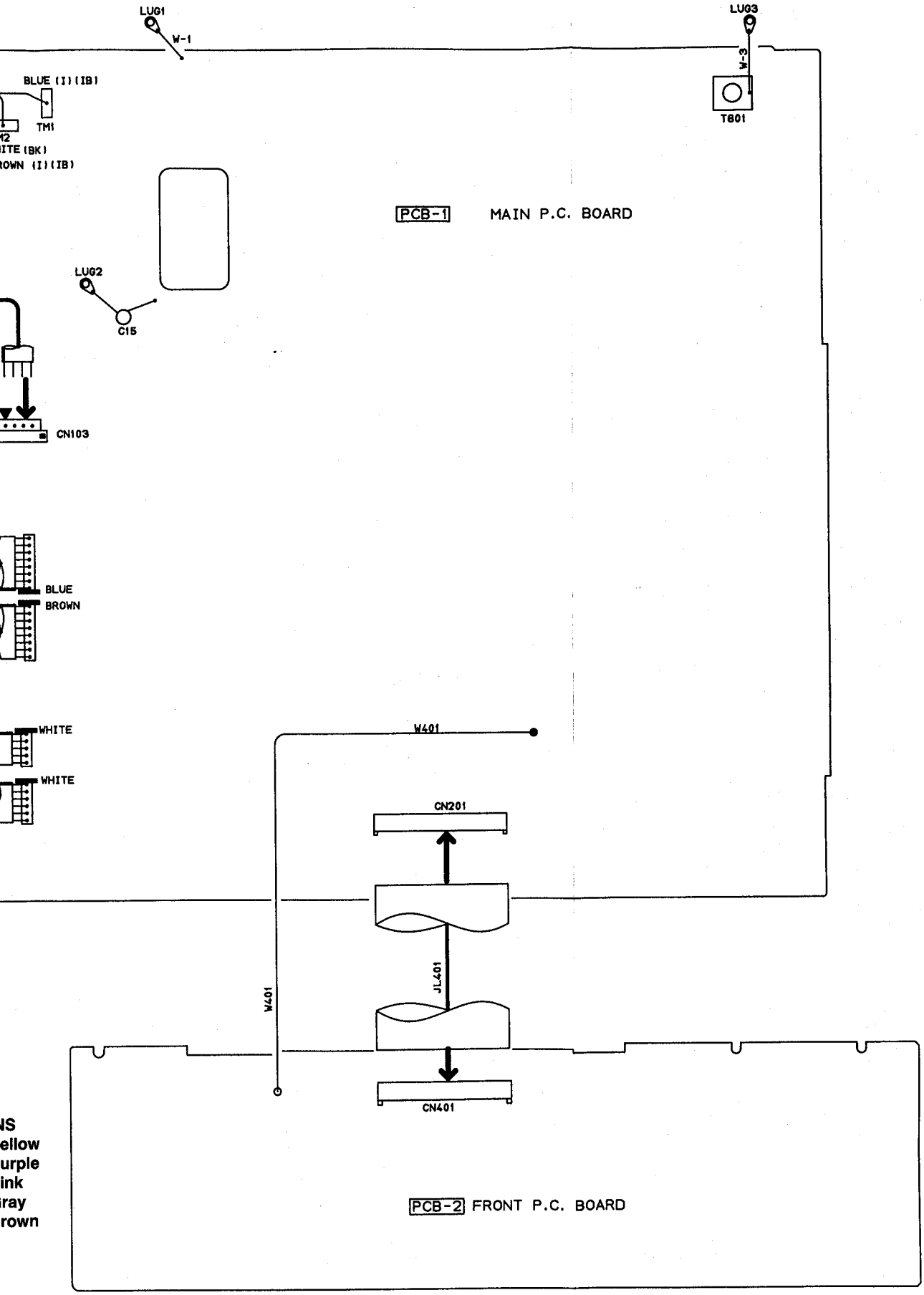
WIRING DIAGRAM



WIRE COLOR ABBREVIATIONS

RED	: Red	YEL	: Yellow
ORG	: Orange	PUP	: Purple
BLU	: Blue	PIK	: Pink
WHT	: White	GRY	: Gray
GRN	: Green	BRN	: Brown
BLK	: Black		

F G H I J



NS
ellow
urple
ink
ray
rown

ELECTRICAL PARTS LIST

Ser. No.	Ref. No.	Part No.	Description
		RCB-1 MAIN P.C. BOARD	
		CAPACITORS	
520	C1	5354-104593	CAP, MYL .1U
520	C2	5354-104593	CAP, MYL .1U
512	⚠ C3	5345-478C0962	CAP, MINI ELE 4700U/16V
513	⚠ C4	5345-228C0962	CAP, MINI ELE 2200U/16V
518	C5	5345-106F0962	CAP, MINI ELE 10U/50V
518	C6	5345-106F0962	CAP, MINI ELE 10U/50V
519	C7	5345-225F0962	CAP, MINI ELE 2.2U/50V
510	C8	5345-228B0962	CAP, MINI ELE 2200U/10V
511	C9	5345-477B0962	CAP, MINI ELE 470U/10V
517	C10	5345-226F0962	CAP, MINI ELE 22U/50V
520	C11	5354-104593	CAP, MYL .1U
514	C12	5345-227E0962	CAP, MINI ELE 220U/35V
521	C15	5354-102J1HM	CAP, MYL 1000P
515	C17	5345-107B0962	CAP, MINI ELE 100U/10V
763	C41	5345-226D0962	CAP, MINI ELE 22U/25V
762	C42	5345-106F0962	CAP, MINI ELE 10U/50V
764	C43	5345-108B0962	CAP, MINI ELE 1000U/10V
765	C44	5354-224593	CAP, MYL .22U
777	C49	5354-104J1HM	CAP, MYL .1U
663	C101	5345-107B0962	CAP, MINI ELE 100U/10V
685	C102	5361-330JCH	CAP, CER 33P
685	C103	5361-330JCH	CAP, CER 33P
683	C104	5361-100DCH	CAP, CER 10P
678	C105	5354-332J1HM	CAP, MYL 3300P
673	C106	5354-333J1HM	CAP, MYL .033U
673	C107	5354-333J1HM	CAP, MYL .033U
676	C108	5354-103J1HM	CAP, MYL .01U
662	C109	5345-476D0962	CAP, MINI ELE 47U/25V
662	C110	5345-476D0962	CAP, MINI ELE 47U/25V
662	C111	5345-476D0962	CAP, MINI ELE 47U/25V
666	C112	5345-474F0962	CAP, MINI ELE .47U/50V
664	C113	5345-226D0962	CAP, MINI ELE 22U/25V
671	C114	5354-823J1HM	CAP, MYL .082U
680	C115	5354-681J1HM	CAP, MYL 680P
668	C116	5354-274593	CAP, MYL .27U
667	C117	5342-105F0951	CAP, ELE BP 1U/50V
670	C118	5354-104J1HM	CAP, MYL .1U
677	C119	5354-472J1HM	CAP, MYL 4700P
674	C121	5354-183J1HM	CAP, MYL .018U
669	C122	5354-184593	CAP, MYL .18U
675	C123	5354-123J1HM	CAP, MYL .012U
682	C124	5354-391K1HM	CAP, MYL 390P
665	C125	5345-476D0962	CAP, MINI ELE 47U/25V
666	C126	5345-474F0962	CAP, MINI ELE .47U/50V
672	C127	5354-563J1HM	CAP, MYL .056U
662	C128	5345-476D0962	CAP, MINI ELE 47U/25V
662	C129	5345-476D0962	CAP, MINI ELE 47U/25V
670	C130	5354-104J1HM	CAP, MYL .1U
670	C131	5354-104J1HM	CAP, MYL .1U
670	C132	5354-104J1HM	CAP, MYL .1U
660	C133	5345-477C0962	CAP, MINI ELE 470U/16V
660	C134	5345-477C0962	CAP, MINI ELE 470U/16V
679	C141	5354-102J1HM	CAP, MYL 1000P
632	C201	5354-222J1HM	CAP, MYL 2200P
630	C202	5354-223J1HM	CAP, MYL .022U
631	C203	5354-471J1HM	CAP, MYL 470P
629	C204	5354-154593	CAP, MYL .15U
627	C206	5345-476B0951	CAP, MINI ELE 47U/10V
681	C209	5354-471J1HM	CAP, MYL 470P
681	C210	5354-471J1HM	CAP, MYL 470P
670	C211	5354-104J1HM	CAP, MYL .1U
684	C212	5361-220JCH	CAP, CER 22P
670	C213	5354-104J1HM	CAP, MYL .1U
661	C214	5345-107D0962	CAP, MINI ELE 100U/25V
661	C215	5345-107D0962	CAP, MINI ELE 100U/25V
628	C217	5353-300534	CAP, MCA 30P
628	C218	5353-300534	CAP, MCA 30P
540	C301	5345-227B0962	CAP, MINI ELE 220U/10V
540	C302	5345-227B0962	CAP, MINI ELE 220U/10V
540	C303	5345-227B0962	CAP, MINI ELE 220U/10V
540	C304	5345-227B0962	CAP, MINI ELE 220U/10V
544	C309	5359-1035851	CAP, PPP .01U
544	C310	5359-1035851	CAP, PPP .01U
547	C311	5359-6815851	CAP, PPP 680P
547	C312	5359-6815851	CAP, PPP 680P
543	C313	5359-1835851	CAP, PPP .018U
543	C314	5359-1835851	CAP, PPP .018U
546	C315	5359-8215851	CAP, PPP 820P
546	C316	5359-8215851	CAP, PPP 820P
541	C317	5345-476B0951	CAP, MINI ELE 47U/10V
541	C318	5345-476B0951	CAP, MINI ELE 47U/10V
545	C319	5359-8225851	CAP, PPP 8200P
545	C320	5359-8225851	CAP, PPP 8200P
548	C321	5354-104J1HM	CAP, MYL .1U
584	C601	5345-227B0962	CAP, MINI ELE 220U/10V
584	C602	5345-227B0962	CAP, MINI ELE 220U/10V
583	C603	5345-477B0962	CAP, MINI ELE 470U/10V
583	C604	5345-477B0962	CAP, MINI ELE 470U/10V
583	C605	5345-477B0962	CAP, MINI ELE 470U/10V
583	C606	5345-477B0962	CAP, MINI ELE 470U/10V
584	C607	5345-227B0962	CAP, MINI ELE 220U/10V
584	C608	5345-227B0962	CAP, MINI ELE 220U/10V
591	C609	5354-104J1HM	CAP, MYL .1U
591	C610	5354-104J1HM	CAP, MYL .1U
591	C611	5354-104J1HM	CAP, MYL .1U
591	C612	5354-104J1HM	CAP, MYL .1U
587	C613	5359-4725851	CAP, PPP 4700P
587	C614	5359-4725851	CAP, PPP 4700P
587	C615	5359-4725851	CAP, PPP 4700P
587	C616	5359-4725851	CAP, PPP 4700P
586	C631	5353-030534	CAP, MCA 3P
586	C632	5353-030534	CAP, MCA 3P
590	C633	5359-5615851	CAP, PPP 560P
590	C634	5359-5615851	CAP, PPP 560P
589	C651	5359-6815851	CAP, PPP 680P
589	C652	5359-6815851	CAP, PPP 680P
588	C653	5359-1525851	CAP, PPP 1500P
588	C654	5359-1525851	CAP, PPP 1500P
585	C655	5345-107B0962	CAP, MINI ELE 100U/10V
585	C656	5345-107B0962	CAP, MINI ELE 100U/10V
806	C801	5345-476C0962	CAP, MINI ELE 47U/16V
809	C803	5359-5605851	CAP, PPP 56P
805	C804	5345-336C0962	CAP, MINI ELE 33U/16V
807	C806	5354-104J1HM	CAP, MYL .1U
808	C807	5359-3905851	CAP, PPP 39P
783	C901	5345-226D0962	CAP, MINI ELE 22U/25V
784	C903	5361-470KSL	CAP, CER 47P
		RESISTORS	
529	⚠ R1	5102-4R74713	RES, FUSE 4.7
529	⚠ R2	5102-4R74713	RES, FUSE 4.7
526	R3	5232-471J16P	RES, CBN 1/6P 470
526	R4	5232-471J16P	RES, CBN 1/6P 470
528	⚠ R5	5102-1015116	RES, FUSE 100
528	⚠ R6	5102-1015116	RES, FUSE 100
527	R7	5232-822J16P	RES, CBN 1/6P 8.2K
522	R8	5134-121J25P	RES, CBN 1/4P 120
525	R9	5134-223J25P	RES, CBN 1/4P 22K
524	R10	5134-152J25P	RES, CBN 1/4P 1.5K
523	R11	5134-331J25P	RES, CBN 1/4P 330
770	R40	5134-222J25P	RES, CBN 1/4P 2.2K
766	R41	5135-271J50P	RES, CBN 1/2P 270
768	R42	5134-472J25P	RES, CBN 1/4P 4.7K
775	R43	5232-224J16P	RES, CBN 1/6P 220K
774	R44	5232-473J16P	RES, CBN 1/6P 47K
774	R45	5232-473J16P	RES, CBN 1/6P 47K
772	R46	5134-101J25P	RES, CBN 1/4P 100
773	R47	5232-103J16P	RES, CBN 1/6P 10K
771	R48	5134-154J25P	RES, CBN 1/4P 150K
769	R49	5134-103J25P	RES, CBN 1/4P 10K
769	R50	5134-103J25P	RES, CBN 1/4P 10K
769	R51	5134-103J25P	RES, CBN 1/4P 10K
769	R52	5134-103J25P	RES, CBN 1/4P 10K
766	R53	5135-271J50P	RES, CBN 1/2P 270
767	R54	5134-102J25P	RES, CBN 1/4P 1K
776	R55	5134-103J25P	RES, CBN 1/4P 10K
690	R101	5134-220J25P	RES, CBN 1/4P 22
693	R102	5134-222J25P	RES, CBN 1/4P 2.2K
708	R103	5232-163J16P	RES, CBN 1/6P 16K
705	R104	5232-822J16P	RES, CBN 1/6P 8.2K
696	R105	5134-223J25P	RES, CBN 1/4P 22K
692	R106	5134-102J25P	RES, CBN 1/4P 1K
691	R107	5134-221J25P	RES, CBN 1/4P 220
709	R108	5232-183J16P	RES, CBN 1/6P 18K
721	R109	5134-183J25P	RES, CBN 1/4P 18K
692	R110	5134-102J25P	RES, CBN 1/4P 1K
694	R111	5134-103J25P	RES, CBN 1/4P 10K
715	R112	5232-104J16P	RES, CBN 1/6P 100K
695	R113	5134-183J25P	RES, CBN 1/4P 18K
696	R114	5134-223J25P	RES, CBN 1/4P 22K
714	R115	5232-683J16P	RES, CBN 1/6P 68K
707	R116	5232-153J16P	RES, CBN 1/6P 15K
704	R117	5232-682J16P	RES, CBN 1/6P 6.8K
700	R118	5232-221J16P	RES, CBN 1/6P 220
713	R119	5232-473J16P	RES, CBN 1/6P 47K
694	R120	5134-103J25P	RES, CBN 1/4P 10K
706	R121	5232-103J16P	RES, CBN 1/6P 10K
711	R122	5232-273J16P	RES, CBN 1/6P 27K
706	R124	5232-103J16P	RES, CBN 1/6P 10K
715	R126	5232-104J16P	RES, CBN 1/6P 100K
715	R127	5232-104J16P	RES, CBN 1/6P 100K
706	R128	5232-103J16P	RES, CBN 1/6P 10K
706	R129	5232-103J16P	RES, CBN 1/6P 10K
716	R130	5232-224J16P	RES, CBN 1/6P 220K
715	R131	5232-104J16P	RES, CBN 1/6P 100K
703	R132	5232-562J16P	RES, CBN 1/6P 5.6K
701	R133	5232-102J16P	RES, CBN 1/6P 1K
697	R134	5134-563J25P	RES, CBN 1/4P 56K
707	R135	5232-153J16P	RES, CBN 1/6P 15K
707	R136	5232-153J16P	RES, CBN 1/6P 15K
712	R137	5232-393J16P	RES, CBN 1/6P 39K
710	R138	5232-223J16P	RES, CBN 1/6P 22K
702	R139	5232-332J16P	RES, CBN 1/6P 3.3K
711	R140	5232-273J16P	RES, CBN 1/6P 27K
699	R141	5232-100J16P	RES, CBN 1/6P 10
699	R142	5232-100J16P	RES, CBN 1/6P 10
699	R143	5232-100J16P	RES, CBN 1/6P 10
698	R144	5134-474J25P	RES, CBN 1/4P 470K
697	R145	5134-563J25P	RES, CBN 1/4P 56K
689	R146	5134-2R2J25P	RES, CBN 1/4P 2.2
688	R150	5135-220J50P	RES, CBN 1/2P 22
688	R151	5135-220J50P	RES, CBN 1/2P 22
688	R152	5135-220J50P	RES, CBN 1/2P 22
688	R153	5135-220J50P	RES, CBN 1/2P 22
720	⚠ R154	5102-4R75116	RES, FUSE 4.7
720	⚠ R155	5102-4R75116	RES, FUSE 4.7
718	R156	5232-105J16P	RES, CBN 1/6P 1M
642	R201	5232-333J16P	RES, CBN 1/6P 33K
640	R202	5232-222J16P	RES, CBN 1/6P 2.2K
639	R203	5134-104J25P	RES, CBN 1/4P 100K
638	R204	5134-103J25P	RES, CBN 1/4P 10K
643	R205	5232-104J16P	RES, CBN 1/6P 100K
644	R206	5232-105J16P	RES, CBN 1/6P 1M
696	R207	5134-223J25P	RES, CBN 1/4P 22K
715	R209	5232-104J16P	RES, CBN 1/6P 100K
715	R210	5232-104J16P	RES, CBN 1/6P 100K
717	R211	5232-104J16P	RES, CBN 1/6P 100K
717	R212	5232-104J16P	RES, CBN 1/6P 100K
699	R213	5232-100J16P	RES, CBN 1/6P 10
715	R214	5232-104J16P	RES, CBN 1/6P 100K
715	R215	5232-104J16P	RES, CBN 1/6P 100K
714	R216	5232-683J16P	RES, CBN 1/6P 68K
714	R217	5232-683J16P	RES, CBN 1/6P 68K
699	R218	5232-100J16P	RES, CBN 1/6P 10
635	R219	5134-152J25P	RES, CBN 1/4P 1.5K
720	⚠ R220	5102-4R75116	RES, FUSE 4.7
720	⚠ R221	5102-4R75116	RES, FUSE 4.7
634	R222	5135-330J50P	RES, CBN 1/2P 33
719	R223	5232-474J16P	RES, CBN 1/6P 470K
636	R224	5134-222J25P	RES, CBN 1/4P 2.2K
636	R225	5134-222J25P	RES, CBN 1/4P 2.2K
636	R226	5134-222J25P	RES, CBN 1/4P 2.2K
640	R227	5232-222J16P	RES, CBN 1/6P 2.2K
640	R228	5232-222J16P	RES, CBN 1/6P 2.2K
640	R229	5232-222J16P	RES, CBN 1/6P 2.2K
641	R230	5232-103J16P	RES, CBN 1/6P 10K
641	R231	5232-103J16P	RES, CBN 1/6P 10K
706	R251	5232-103J16P	RES, CBN 1/6P 10K
706	R252	5232-103J16P	RES, CBN 1/6P 10K
706	R253	5232-103J16P	RES, CBN 1/6P 10K
706	R254	5232-103J16P	RES, CBN 1/6P 10K
694	R255	5134-103J25P	RES, CBN 1/4P 10K
645	R256	5134-102J25P	RES, CBN 1/4P 1K
637	R257	5134-472J25P	RES, CBN 1/4P 4.7K
638	R258	5134-103J25P	RES, CBN 1/4P 10K
550	R301	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R302	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R303	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R304	5134-2R2J25P	RES, CBN 1/4P 2.2
553	R305	5134-101J25P	RES, CBN 1/4P 100
553	R306	5134-101J25P	RES, CBN 1/4P 100
553	R307	5134-101J25P	RES, CBN 1/4P 100
553	R308	5134-101J25P	RES, CBN 1/4P 100
558	R309	5134-102J25P	RES, CBN 1/4P 1K
558	R310	5134-102J25P	RES, CBN 1/4P 1K
558	R313	5134-102J25P	RES, CBN 1/4P 1K
558	R314	5134-102J25P	RES, CBN 1/4P 1K
550	R317	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R318	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R319	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R320	5134-2R2J25P	RES, CBN 1/4P 2.2
562	R321	5134-512J25P	RES, CBN 1/4P 5.1K
562	R322	5134-512J25P	RES, CBN 1/4P 5.1K
563	R323	5134-622J25P	RES, CBN 1/4P 6.2K
563	R324	5134-622J25P	RES, CBN 1/4P 6.2K
556	R325	5134-821J25P	RES, CBN 1/4P 820
556	R326	5134-821J25P	RES, CBN 1/4P 820
552	R327	5134-470J25P	RES, CBN 1/4P 47
552	R328	5134-470J25P	RES, CBN 1/4P 47
552	R329	5134-470J25P	RES, CBN 1/4P 47
552	R330	5134-470J25P	RES, CBN 1/4P 47
556	R331	5134-821J25P	RES, CBN 1/4P 820
556	R332	5134-821J25P	RES, CBN 1/4P 820
560	R333	5134-222J25P	RES, CBN 1/4P 2.2K
560	R334	5134-222J25P	RES, CBN 1/4P 2.2K
560	R335	5134-222J25P	RES, CBN 1/4P 2.2K
560	R336	5134-222J25P	RES, CBN 1/4P 2.2K
556	R337	5134-821J25P	RES, CBN 1/4P 820
556	R338	5134-821J25P	RES, CBN 1/4P 820
552	R339	5134-470J25P	RES, CBN 1/4P 47
552	R340	5134-470J25P	RES, CBN 1/4P 47
552	R341	5134-470J25P	RES, CBN 1/4P 47
552	R342	5134-470J25P	RES, CBN 1/4P 47
556	R343	5134-821J25P	RES, CBN 1/4P 820
556	R344	5134-821J25P	RES, CBN 1/4P 820
551	R345	5134-220J25P	RES, CBN 1/4P 22
551	R346	5134-220J25P	RES, CBN 1/4P 22
551	R347	5134-220J25P	RES, CBN 1/4P 22
551	R348	5134-220J25P	RES, CBN 1/4P 22
554	R349	5134-471J25P	RES, CBN 1/4P 470
554	R350	5134-471J25P	RES, CBN 1/4P 470
561	R351	5134-472J25P	RES, CBN 1/4P 4.7K
561	R352	5134-472J25P	RES, CBN 1/4P 4.7K
553	R353	5134-101J25P	RES, CBN 1/4P 100
553	R354	5134-101J25P	RES, CBN 1/4P 100
559	R355	5134-122J25P	RES, CBN 1/4P 1.2K
559	R356	5134-122J25P	RES, CBN 1/4P 1.2K
561	R357	5134-472J25P	RES, CBN 1/4P 4.7K
561	R358	5134-472J25P	RES, CBN 1/4P 4.7K
554	R359	5134-471J25P	RES, CBN 1/4P 470
554	R360	5134-471J25P	RES, CBN 1/4P 470
550	R361	5134-2R2J25P	RES, CBN 1/4P 2.2

ELECTRICAL PARTS LIST

Ser. No.	Ref. No.	Part No.	Description
		PCB-1 MAIN P.C.BOARD	
		CAPACITORS	
520	C1	5354-104593	CAP, MYL .1U
520	C2	5354-104593	CAP, MYL .1U
512	⚠ C3	5345-478C0962	CAP, MINI ELE 4700U/16V
513	⚠ C4	5345-228C0962	CAP, MINI ELE 2200U/16V
518	C5	5345-106F0962	CAP, MINI ELE 10U/50V
518	C6	5345-106F0962	CAP, MINI ELE 10U/50V
519	C7	5345-225F0962	CAP, MINI ELE 2.2U/50V
510	C8	5345-228B0962	CAP, MINI ELE 2200U/10V
511	C9	5345-477B0962	CAP, MINI ELE 470U/10V
517	C10	5345-226F0962	CAP, MINI ELE 22U/50V
520	C11	5354-104593	CAP, MYL .1U
514	C12	5345-227E0962	CAP, MINI ELE 220U/35V
521	C15	5354-102J1HM	CAP, MYL 1000P
515	C17	5345-107B0962	CAP, MINI ELE 100U/10V
763	C41	5345-226D0962	CAP, MINI ELE 22U/25V
762	C42	5345-106F0962	CAP, MINI ELE 10U/50V
764	C43	5345-108B0962	CAP, MINI ELE 1000U/10V
765	C44	5354-224593	CAP, MYL .22U
777	C49	5354-104J1HM	CAP, MYL .1U
663	C101	5345-107B0962	CAP, MINI ELE 100U/10V
685	C102	5361-330JCH	CAP, CER 33P
685	C103	5361-330JCH	CAP, CER 33P
683	C104	5361-100DCH	CAP, CER 10P
678	C105	5354-332J1HM	CAP, MYL 3300P
673	C106	5354-333J1HM	CAP, MYL .033U
673	C107	5354-333J1HM	CAP, MYL .033U
676	C108	5354-103J1HM	CAP, MYL .01U
662	C109	5345-476D0962	CAP, MINI ELE 47U/25V
662	C110	5345-476D0962	CAP, MINI ELE 47U/25V
662	C111	5345-476D0962	CAP, MINI ELE 47U/25V
666	C112	5345-474F0962	CAP, MINI ELE .47U/50V
664	C113	5345-226D0962	CAP, MINI ELE 22U/25V
671	C114	5354-823J1HM	CAP, MYL .082U
680	C115	5354-681J1HM	CAP, MYL 680P
668	C116	5354-274593	CAP, MYL .27U
667	C117	5342-105F0951	CAP, ELE BP 1U/50V
670	C118	5354-104J1HM	CAP, MYL .1U
677	C119	5354-472J1HM	CAP, MYL 4700P
674	C121	5354-183J1HM	CAP, MYL .018U
669	C122	5354-184593	CAP, MYL .18U
675	C123	5354-123J1HM	CAP, MYL .012U
682	C124	5354-391K1HM	CAP, MYL 390P
665	C125	5345-476D0962	CAP, MINI ELE 47U/25V
666	C126	5345-474F0962	CAP, MINI ELE .47U/50V
672	C127	5354-563J1HM	CAP, MYL .056U
662	C128	5345-476D0962	CAP, MINI ELE 47U/25V
662	C129	5345-476D0962	CAP, MINI ELE 47U/25V
670	C130	5354-104J1HM	CAP, MYL .1U
670	C131	5354-104J1HM	CAP, MYL .1U
670	C132	5354-104J1HM	CAP, MYL .1U
660	C133	5345-477C0962	CAP, MINI ELE 470U/16V
660	C134	5345-477C0962	CAP, MINI ELE 470U/16V
679	C141	5354-102J1HM	CAP, MYL 1000P
632	C201	5354-222J1HM	CAP, MYL 2200P
630	C202	5354-223J1HM	CAP, MYL .022U
631	C203	5354-471J1HM	CAP, MYL 470P
629	C204	5354-154593	CAP, MYL .15U
627	C206	5345-476B0951	CAP, MINI ELE 47U/10V
681	C209	5354-471J1HM	CAP, MYL 470P
681	C210	5354-471J1HM	CAP, MYL 470P
670	C211	5354-104J1HM	CAP, MYL .1U
684	C212	5361-220JCH	CAP, CER 22P
670	C213	5354-104J1HM	CAP, MYL .1U
661	C214	5345-107D0962	CAP, MINI ELE 100U/25V
661	C215	5345-107D0962	CAP, MINI ELE 100U/25V
628	C217	5353-300534	CAP, MCA 30P
628	C218	5353-300534	CAP, MCA 30P
540	C301	5345-227B0962	CAP, MINI ELE 220U/10V
540	C302	5345-227B0962	CAP, MINI ELE 220U/10V
540	C303	5345-227B0962	CAP, MINI ELE 220U/10V
540	C304	5345-227B0962	CAP, MINI ELE 220U/10V
544	C309	5359-1035851	CAP, PPP .01U
544	C310	5359-1035851	CAP, PPP .01U
547	C311	5359-6815851	CAP, PPP 680P
547	C312	5359-6815851	CAP, PPP 680P
543	C313	5359-1835851	CAP, PPP .018U
543	C314	5359-1835851	CAP, PPP .018U
546	C315	5359-8215851	CAP, PPP 820P
546	C316	5359-8215851	CAP, PPP 820P
541	C317	5345-476B0951	CAP, MINI ELE 47U/10V
541	C318	5345-476B0951	CAP, MINI ELE 47U/10V
545	C319	5359-8225851	CAP, PPP 8200P
545	C320	5359-8225851	CAP, PPP 8200P
548	C321	5354-104J1HM	CAP, MYL .1U
584	C601	5345-227B0962	CAP, MINI ELE 220U/10V
584	C602	5345-227B0962	CAP, MINI ELE 220U/10V
583	C603	5345-477B0962	CAP, MINI ELE 470U/10V
583	C604	5345-477B0962	CAP, MINI ELE 470U/10V
583	C605	5345-477B0962	CAP, MINI ELE 470U/10V
583	C606	5345-477B0962	CAP, MINI ELE 470U/10V
584	C607	5345-227B0962	CAP, MINI ELE 220U/10V
584	C608	5345-227B0962	CAP, MINI ELE 220U/10V
591	C609	5354-104J1HM	CAP, MYL .1U
591	C610	5354-104J1HM	CAP, MYL .1U
591	C611	5354-104J1HM	CAP, MYL .1U
591	C612	5354-104J1HM	CAP, MYL .1U
587	C613	5359-4725851	CAP, PPP 4700P
587	C614	5359-4725851	CAP, PPP 4700P
587	C615	5359-4725851	CAP, PPP 4700P
587	C616	5359-4725851	CAP, PPP 4700P
586	C631	5353-030534	CAP, MCA 3P
586	C632	5353-030534	CAP, MCA 3P
590	C633	5359-5615851	CAP, PPP 560P
590	C634	5359-5615851	CAP, PPP 560P
589	C651	5359-6815851	CAP, PPP 680P
589	C652	5359-6815851	CAP, PPP 680P
588	C653	5359-1525851	CAP, PPP 1500P
588	C654	5359-1525851	CAP, PPP 1500P
585	C655	5345-107B0962	CAP, MINI ELE 100U/10V
585	C656	5345-107B0962	CAP, MINI ELE 100U/10V
806	C801	5345-476C0962	CAP, MINI ELE 47U/16V
809	C803	5359-5605851	CAP, PPP 56P
805	C804	5345-336C0962	CAP, MINI ELE 33U/16V
807	C806	5354-104J1HM	CAP, MYL .1U
808	C807	5359-3905851	CAP, PPP 39P
783	C901	5345-226D0962	CAP, MINI ELE 22U/25V
784	C903	5361-470KSL	CAP, CER 47P
		RESISTORS	
529	⚠ R1	5102-4R74713	RES, FUSE 4.7
529	⚠ R2	5102-4R74713	RES, FUSE 4.7
526	R3	5232-471J16P	RES, CBN 1/6P 470
526	R4	5232-471J16P	RES, CBN 1/6P 470
528	⚠ R5	5102-1015116	RES, FUSE 100
528	⚠ R6	5102-1015116	RES, FUSE 100
527	R7	5232-822J16P	RES, CBN 1/6P 8.2K
522	R8	5134-121J25P	RES, CBN 1/4P 120
525	R9	5134-223J25P	RES, CBN 1/4P 22K
524	R10	5134-152J25P	RES, CBN 1/4P 1.5K
523	R11	5134-331J25P	RES, CBN 1/4P 330
770	R40	5134-222J25P	RES, CBN 1/4P 2.2K
766	R41	5135-271J50P	RES, CBN 1/2P 270
768	R42	5134-472J25P	RES, CBN 1/4P 4.7K
775	R43	5232-224J16P	RES, CBN 1/6P 220K
774	R44	5232-473J16P	RES, CBN 1/6P 47K
774	R45	5232-473J16P	RES, CBN 1/6P 47K
772	R46	5134-101J25P	RES, CBN 1/4P 100
773	R47	5232-103J16P	RES, CBN 1/6P 10K
771	R48	5134-154J25P	RES, CBN 1/4P 150K
769	R49	5134-103J25P	RES, CBN 1/4P 10K
769	R50	5134-103J25P	RES, CBN 1/4P 10K
769	R51	5134-103J25P	RES, CBN 1/4P 10K

Ser. No.	Ref. No.	Part No.	Description
769	R52	5134-103J25P	RES, CBN 1/4P 10K
766	R53	5135-271J50P	RES, CBN 1/2P 270
767	R54	5134-102J25P	RES, CBN 1/4P 1K
776	R55	5134-103J25P	RES, CBN 1/4P 10K
690	R101	5134-220J25P	RES, CBN 1/4P 22
693	R102	5134-222J25P	RES, CBN 1/4P 2.2K
708	R103	5232-163J16P	RES, CBN 1/6P 16K
705	R104	5232-822J16P	RES, CBN 1/6P 8.2K
696	R105	5134-223J25P	RES, CBN 1/4P 22K
692	R106	5134-102J25P	RES, CBN 1/4P 1K
691	R107	5134-221J25P	RES, CBN 1/4P 220
709	R108	5232-183J16P	RES, CBN 1/6P 18K
721	R109	5134-183J25P	RES, CBN 1/4P 18K
692	R110	5134-102J25P	RES, CBN 1/4P 1K
694	R111	5134-103J25P	RES, CBN 1/4P 10K
715	R112	5232-104J16P	RES, CBN 1/6P 100K
695	R113	5134-183J25P	RES, CBN 1/4P 18K
696	R114	5134-223J25P	RES, CBN 1/4P 22K
714	R115	5232-683J16P	RES, CBN 1/6P 68K
707	R116	5232-153J16P	RES, CBN 1/6P 15K
704	R117	5232-682J16P	RES, CBN 1/6P 6.8K
700	R118	5232-221J16P	RES, CBN 1/6P 220
713	R119	5232-473J16P	RES, CBN 1/6P 47K
694	R120	5134-103J25P	RES, CBN 1/4P 10K
706	R121	5232-103J16P	RES, CBN 1/6P 10K
711	R122	5232-273J16P	RES, CBN 1/6P 27K
706	R124	5232-103J16P	RES, CBN 1/6P 10K
715	R126	5232-104J16P	RES, CBN 1/6P 100K
715	R127	5232-104J16P	RES, CBN 1/6P 100K
706	R128	5232-103J16P	RES, CBN 1/6P 10K
706	R129	5232-103J16P	RES, CBN 1/6P 10K
716	R130	5232-224J16P	RES, CBN 1/6P 220K
715	R131	5232-104J16P	RES, CBN 1/6P 100K
703	R132	5232-562J16P	RES, CBN 1/6P 5.6K
701	R133	5232-102J16P	RES, CBN 1/6P 1K
697	R134	5134-563J25P	RES, CBN 1/4P 56K
707	R135	5232-153J16P	RES, CBN 1/6P 15K
707	R136	5232-153J16P	RES, CBN 1/6P 15K
712	R137	5232-393J16P	RES, CBN 1/6P 39K
710	R138	5232-223J16P	RES, CBN 1/6P 22K
702	R139	5232-332J16P	RES, CBN 1/6P 3.3K
711	R140	5232-273J16P	RES, CBN 1/6P 27K
699	R141	5232-100J16P	RES, CBN 1/6P 10
699	R142	5232-100J16P	RES, CBN 1/6P 10
699	R143	5232-100J16P	RES, CBN 1/6P 10
698	R144	5134-474J25P	RES, CBN 1/4P 470K
697	R145	5134-563J25P	RES, CBN 1/4P 56K
689	R146	5134-2R2J25P	RES, CBN 1/4P 2.2
688	R150	5135-220J50P	RES, CBN 1/2P 22
688	R151	5135-220J50P	RES, CBN 1/2P 22
688	R152	5135-220J50P	RES, CBN 1/2P 22
688	R153	5135-220J50P	RES, CBN 1/2P 22
720	⚠ R154	5102-4R75116	RES, FUSE 4.7
720	⚠ R155	5102-4R75116	RES, FUSE 4.7
718	R156	5232-105J16P	RES, CBN 1/6P 1M
642	R201	5232-333J16P	RES, CBN 1/6P 33K
640	R202	5232-222J16P	RES, CBN 1/6P 2.2K
639	R203	5134-104J25P	RES, CBN 1/4P 100K
638	R204	5134-103J25P	RES, CBN 1/4P 10K
643	R205	5232-104J16P	RES, CBN 1/6P 100K
644	R206	5232-105J16P	RES, CBN 1/6P 1M
696	R207	5134-223J25P	RES, CBN 1/4P 22K
715	R209	5232-104J16P	RES, CBN 1/6P 100K
715	R210	5232-104J16P	RES, CBN 1/6P 100K
717	R211	5232-104J16P	RES, CBN 1/6P 100K
717	R212	5232-104J16P	RES, CBN 1/6P 100K
699	R213	5232-100J16P	RES, CBN 1/6P 10
715	R214	5232-104J16P	RES, CBN 1/6P 100K
715	R215	5232-104J16P	RES, CBN 1/6P 100K
714	R216	5232-683J16P	RES, CBN 1/6P 68K
714	R217	5232-683J16P	RES, CBN 1/6P 68K
699	R218	5232-100J16P	RES, CBN 1/6P 10
635	R219	5134-152J25P	RES, CBN 1/4P 1.5K
720	⚠ R220	5102-4R75116	RES, FUSE 4.7
720	⚠ R221	5102-4R75116	RES, FUSE 4.7

Ser. No.	Ref. No.	Part No.	Description
634	R222	5135-330J50P	RES, CBN 1/2P 33
719	R223	5232-474J16P	RES, CBN 1/6P 470K
636	R224	5134-222J25P	RES, CBN 1/4P 2.2K
636	R225	5134-222J25P	RES, CBN 1/4P 2.2K
636	R226	5134-222J25P	RES, CBN 1/4P 2.2K
640	R227	5232-222J16P	RES, CBN 1/6P 2.2K
640	R228	5232-222J16P	RES, CBN 1/6P 2.2K
640	R229	5232-222J16P	RES, CBN 1/6P 2.2K
641	R230	5232-103J16P	RES, CBN 1/6P 10K
641	R231	5232-103J16P	RES, CBN 1/6P 10K
706	R251	5232-103J16P	RES, CBN 1/6P 10K
706	R252	5232-103J16P	RES, CBN 1/6P 10K
706	R253	5232-103J16P	RES, CBN 1/6P 10K
706	R254	5232-103J16P	RES, CBN 1/6P 10K
694	R255	5134-103J25P	RES, CBN 1/4P 10K
645	R256	5134-102J25P	RES, CBN 1/4P 1K
637	R257	5134-472J25P	RES, CBN 1/4P 4.7K
638	R258	5134-103J25P	RES, CBN 1/4P 10K
550	R301	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R302	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R303	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R304	5134-2R2J25P	RES, CBN 1/4P 2.2
553	R305	5134-101J25P	RES, CBN 1/4P 100
553	R306	5134-101J25P	RES, CBN 1/4P 100
553	R307	5134-101J25P	RES, CBN 1/4P 100
553	R308	5134-101J25P	RES, CBN 1/4P 100
558	R309	5134-102J25P	RES, CBN 1/4P 1K
558	R310	5134-102J25P	RES, CBN 1/4P 1K
558	R313	5134-102J25P	RES, CBN 1/4P 1K
558	R314	5134-102J25P	RES, CBN 1/4P 1K
550	R317	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R318	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R319	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R320	5134-2R2J25P	RES, CBN 1/4P 2.2
562	R321	5134-512J25P	RES, CBN 1/4P 5.1K
562	R322	5134-512J25P	RES, CBN 1/4P 5.1K
563	R323	5134-622J25P	RES, CBN 1/4P 6.2K
563	R324	5134-622J25P	RES, CBN 1/4P 6.2K
556	R325	5134-821J25P	RES, CBN 1/4P 820
556	R326	5134-821J25P	RES, CBN 1/4P 820
552	R327	5134-470J25P	RES, CBN 1/4P 47
552	R328	5134-470J25P	RES, CBN 1/4P 47
552	R329	5134-470J25P	RES, CBN 1/4P 47
552	R330	5134-470J25P	RES, CBN 1/4P 47
556	R331	5134-821J25P	RES, CBN 1/4P 820
556	R332	5134-821J25P	RES, CBN 1/4P 820
560	R333	5134-222J25P	RES, CBN 1/4P 2.2K
560	R334	5134-222J25P	RES, CBN 1/4P 2.2K
560	R335	5134-222J25P	RES, CBN 1/4P 2.2K
560	R336	5134-222J25P	RES, CBN 1/4P 2.2K
556	R337	5134-821J25P	RES, CBN 1/4P 820
556	R338	5134-821J25P	RES, CBN 1/4P 820
552	R339	5134-470J25P	RES, CBN 1/4P 47
552	R340	5134-470J25P	RES, CBN 1/4P 47
552	R341	5134-470J25P	RES, CBN 1/4P 47
552	R342	5134-470J25P	RES, CBN 1/4P 47
556	R343	5134-821J25P	RES, CBN 1/4P 820
556	R344	5134-821J25P	RES, CBN 1/4P 820
551	R345	5134-220J25P	RES, CBN 1/4P 22
551	R346	5134-220J25P	RES, CBN 1/4P 22
551	R347	5134-220J25P	RES, CBN 1/4P 22
551	R348	5134-220J25P	RES, CBN 1/4P 22
554	R349	5134-471J25P	RES, CBN 1/4P 470
554	R350	5134-471J25P	RES, CBN 1/4P 470
561	R351	5134-472J25P	RES, CBN 1/4P 4.7K
561	R352	5134-472J25P	RES, CBN 1/4P 4.7K
553	R353	5134-101J25P	RES, CBN 1/4P 100
553	R354	5134-101J25P	RES, CBN 1/4P 100
559	R355	5134-122J25P	RES, CBN 1/4P 1.2K
559	R356	5134-122J25P	RES, CBN 1/4P 1.2K
561	R357	5134-472J25P	RES, CBN 1/4P 4.7K
561	R358	5134-472J25P	RES, CBN 1/4P 4.7K
554	R359	5134-471J25P	RES, CBN 1/4P 470
554	R360	5134-471J25P	RES, CBN 1/4P 470
550	R361	5134-2R2J25P	RES, CBN 1/4P 2.2

Ser. No.	Ref. No.	Part No.	Description
550	R362	5134-2R2J25P	RES, CBN 1/4P 2.2
557	R363	5134-821J25P	RES, CBN 1/4P 820
557	R364	5134-821J25P	RES, CBN 1/4P 820
566	R365	5134-105J25P	RES, CBN 1/4P 1M
566	R366	5134-105J25P	RES, CBN 1/4P 1M
557	R367	5134-821J25P	RES, CBN 1/4P 820
557	R368	5134-821J25P	RES, CBN 1/4P 820
553	R369	5134-101J25P	RES, CBN 1/4P 100
553	R370	5134-101J25P	RES, CBN 1/4P 100
561	R371	5134-472J25P	RES, CBN 1/4P 4.7K
561	R372	5134-472J25P	RES, CBN 1/4P 4.7K
554	R373	5134-471J25P	RES, CBN 1/4P 470
554	R374	5134-471J25P	RES, CBN 1/4P 470
550	R377	5134-2R2J25P	RES, CBN 1/4P 2.2
550	R378	5134-2R2J25P	RES, CBN 1/4P 2.2
553	R379	5134-101J25P	RES, CBN 1/4P 100
553	R380	5134-101J25P	RES, CBN 1/4P 100
552	R381	5134-470J25P	RES, CBN 1/4P 47
552	R382	5134-470J25P	RES, CBN 1/4P 47
564	R383	5134-104J25P	RES, CBN 1/4P 100K
564	R384	5134-104J25P	RES, CBN 1/4P 100K
562	R385	5134-512J25P	RES, CBN 1/4P 5.1K
562	R386	5134-512J25P	RES, CBN 1/4P 5.1K
557	R387	5134-821J25P	RES, CBN 1/4P 820
557	R388	5134-821J25P	RES, CBN 1/4P 820
565	R389	5232-154J16P	RES, CBN 1/6P 150K
593	R601	5135-220J50P	RES, CBN 1/2P 22
593	R602	5135-220J50P	RES, CBN 1/2P 22
592	R603	5135-3R3J50P	RES, CBN 1/2P 3.3
592	R604	5135-3R3J50P	RES, CBN 1/2P 3.3
592	R605	5135-3R3J50P	RES, CBN 1/2P 3.3
592	R606	5135-3R3J50P	RES, CBN 1/2P 3.3
592	R607	5135-3R3J50P	RES, CBN 1/2P 3.3
592	R608	5135-3R3J50P	RES, CBN 1/2P 3.3
601	R611	5232-101J16P	RES, CBN 1/6P 100
601	R612	5232-101J16P	RES, CBN 1/6P 100
601	R613	5232-101J16P	RES, CBN 1/6P 100
596	R621	5134-221J25P	RES, CBN 1/4P 220
596	R622	5134-221J25P	RES, CBN 1/4P 220
596	R623	5134-221J25P	RES, CBN 1/4P 220
611	R624	5232-221J16P	RES, CBN 1/6P 220
596	R625	5134-221J25P	RES, CBN 1/4P 220
611	R626	5232-221J16P	RES, CBN 1/6P 220
606	R631	5232-474J16P	RES, CBN 1/6P 470K
606	R632	5232-474J16P	RES, CBN 1/6P 470K
600	R633	5134-184J25P	RES, CBN 1/4P 180K
605	R634	5232-224J16P	RES, CBN 1/6P 220K
607	R635	5232-105J16P	RES, CBN 1/6P 1M
607	R636	5232-105J16P	RES, CBN 1/6P 1M
603	R637	5232-102J16P	RES, CBN 1/6P 1K
603	R638	5232-102J16P	RES, CBN 1/6P 1K
594	R639	5134-220J25P	RES, CBN 1/4P 22
594	R640	5134-220J25P	RES, CBN 1/4P 22
601	R641	5232-101J16P	RES, CBN 1/6P 100
601	R642	5232-101J16P	RES, CBN 1/6P 100
596	R643	5134-221J25P	RES, CBN 1/4P 220
611	R644	5232-221J16P	RES, CBN 1/6P 220
598	R645	5134-681J25P	RES, CBN 1/4P 680
598	R646	5134-681J25P	RES, CBN 1/4P 680
598	R647	5134-681J25P	RES, CBN 1/4P 680
598	R648	5134-681J25P	RES, CBN 1/4P 680
604	R651	5232-223J16P	RES, CBN 1/6P 22K
604	R652	5232-223J16P	RES, CBN 1/6P 22K
601	R653	5232-101J16P	RES, CBN 1/6P 100
601	R654	5232-101J16P	RES, CBN 1/6P 100
602	R655	5232-331J16P	RES, CBN 1/6P 330
602	R656	5232-331J16P	RES, CBN 1/6P 330
597	R657	5134-331J25P	RES, CBN 1/4P 330
597	R658	5134-331J25P	RES, CBN 1/4P 330
599	R659	5134-102J25P	RES, CBN 1/4P 1K
599	R660	5134-102J25P	RES, CBN 1/4P 1K
592	R661	5135-3R3J50P	RES, CBN 1/2P 3.3
592	R662	5135-3R3J50P	RES, CBN 1/2P 3.3
816	R801	5232-750J16P	RES, CBN 1/6P 75
814	R802	5232-221J16P	RES, CBN 1/6P 220
811	R805	5134-101J25P	RES, CBN 1/4P 100
813	R807	5134-331J25P	RES, CBN 1/4P 330
815	R809	5232-101J16P	RES, CBN 1/6P 100
812	R810	5134-221J25P	RES, CBN 1/4P 220
788	R901	5232-392J16P	RES, CBN 1/6P 3.9K
789	R902	5232-473J16P	RES, CBN 1/6P 47K
786	R903	5232-470J16P	RES, CBN 1/6P 47
787	R904	5232-331J16P	RES, CBN 1/6P 330
785	R905	5135-220J50P	RES, CBN 1/2P 22
		INTEGRATED CIRCUITS	
501	IC1	5653-M5290P	IC, LINEAR
652	IC101	5653-CXA1081S	IC, LINEAR
651	IC102	5654-M51594FP	IC, DIGITAL
653	IC103	5653-LA6520	IC, LINEAR
621	IC201	5654-M65820FP	IC, DIGITAL
654	IC203	5653-LA6515	IC, LINEAR
573	IC601	5654-H74H04F	IC, DIGITAL
574	IC602	5654-H74H164F	IC, DIGITAL
574	IC603	5654-H74H164F	IC, DIGITAL
574	IC604	5654-H74H164F	IC, DIGITAL
574	IC605	5654-H74H164F	IC, DIGITAL
574	IC606	5654-H74H164F	IC, DIGITAL
574	IC607	5654-H74H164F	IC, DIGITAL
575	IC608	5654-H74H74F	IC, DIGITAL
577	IC609	5654-PCM61P	IC, DIGITAL
577	IC610	5654-PCM61P	IC, DIGITAL
576	IC611	5654-LC4966	IC, DIGITAL
801	IC801	5654-H74H02P	IC, DIGITAL
		TRANSISTORS	
503	⚠ Q1	5614-2012	XISTOR, NPN A
502	⚠ Q2	5612-1375	XISTOR, PNP A
755	Q41	5611-1015(GR)	XISTOR, PNP R
756	Q43	5613-2878(B)	XISTOR, NPN R
756	Q44	5613-2878(B)	XISTOR, NPN R
756	Q45	5613-2878(B)	XISTOR, NPN R
756	Q46	5613-2878(B)	XISTOR, NPN R
656	Q101	5612-647(C)	XISTOR, PNP A
655	Q102	5613-1815(GR)	XISTOR, NPN R
655	Q103	5613-1815(GR)	XISTOR, NPN R
655	Q104	5613-1815(GR)	XISTOR, NPN R
623	Q201	5613-1815(GR)	XISTOR, NPN R
531	Q301	5613-1815L(GR	XISTOR, NPN R
531	Q302	5613-1815L(GR	XISTOR, NPN R
531	Q303	5613-1815L(GR	XISTOR, NPN R
531	Q304	5613-1815L(GR	XISTOR, NPN R
533	Q305	5611-950(Y)	XISTOR, PNP R
533	Q306	5611-950(Y)	XISTOR, PNP R
533	Q307	5611-950(Y)	XISTOR, PNP R
533	Q308	5611-950(Y)	XISTOR, PNP R
531	Q309	5613-1815L(GR	XISTOR, NPN R
531	Q310	5613-1815L(GR	XISTOR, NPN R
535	Q311	5611-1015L(GR	XISTOR, PNP R
535	Q312	5611-1015L(GR	XISTOR, PNP R
531	Q313	5613-1815L(GR	XISTOR, NPN R
531	Q314	5613-1815L(GR	XISTOR, NPN R
535	Q315	5611-1015L(GR	XISTOR, PNP R
535	Q316	5611-1015L(GR	XISTOR, PNP R
535	Q317	5611-1015L(GR	XISTOR, PNP R
535	Q318	5611-1015L(GR	XISTOR, PNP R
531	Q319	5613-1815L(GR	XISTOR, NPN R
531	Q320	5613-1815L(GR	XISTOR, NPN R
532	Q321	5613-1815L(GR	XISTOR, NPN R
532	Q322	5613-1815L(GR	XISTOR, NPN R
537	Q323	5616-SK246GR2	FET, N-CH
537	Q324	5616-SK246GR2	FET, N-CH
533	Q325	5611-950(Y)	XISTOR, PNP R
533	Q326	5611-950(Y)	XISTOR, PNP R
534	Q327	5613-2878(B)	XISTOR, NPN R
534	Q328	5613-2878(B)	XISTOR, NPN R
537	Q329	5616-SK246GR2	FET, N-CH
537	Q330	5616-SK246GR2	FET, N-CH
533	Q331	5611-950(Y)	XISTOR, PNP R
533	Q332	5611-950(Y)	XISTOR, PNP R

Ser. No.	Ref. No.	Part No.	Description
532	Q333	5613-1815L(GR	XISTOR, NPN R
532	Q334	5613-1815L(GR	XISTOR, NPN R
537	Q335	5616-SK246GR2	FET, N-CH
537	Q336	5616-SK246GR2	FET, N-CH
537	Q337	5616-SK246GR2	FET, N-CH
537	Q338	5616-SK246GR2	FET, N-CH
536	Q339	5611-A114ES	XISTOR, PNP R
579	Q651	5613-1815(GR)	XISTOR, NPN R
579	Q652	5613-1815(GR)	XISTOR, NPN R
580	Q653	5611-1015(GR)	XISTOR, PNP R
580	Q654	5611-1015(GR)	XISTOR, PNP R
780	Q901	5611-A143ES	XISTOR, PNP R
		DIODES	
508	⚠ D1	5632-S5566B	DIODE, RECT
508	⚠ D2	5632-S5566B	DIODE, RECT
508	⚠ D3	5632-S5566B	DIODE, RECT
508	⚠ D4	5632-S5566B	DIODE, RECT
508	⚠ D5	5632-S5566B	DIODE, RECT
508	⚠ D6	5632-S5566B	DIODE, RECT
505	⚠ D7	5635-HZ5B-2	DIODE, ZENER
506	⚠ D8	5635-HZ27-2	DIODE, ZENER
508	⚠ D9	5632-S5566B	DIODE, RECT
508	⚠ D10	5632-S5566B	DIODE, RECT
759	D41	5636-1S2473	DIODE, SWITCH
760	⚠ D42	5635-HZ7B2L	DIODE, ZENER
758	D43	5636-1SS133	DIODE, SWITCH
758	D44	5636-1SS133	DIODE, SWITCH
657	D103	5636-1SS133	DIODE, SWITCH
658	D106	5636-1SS133	DIODE, SWITCH
581	D601	5636-1SS133	DIODE, SWITCH
581	D602	5636-1SS133	DIODE, SWITCH
		TRANSFORMERS	
821A	⚠ T1	5584-T1701	XFORMER, POWER BK
821	⚠ T1	5584-T1702	XFORMER, POWER I IB
		COIL	
803	T801	5933-S0801	COIL CASE, 10
		CONTROLS	
687	VR101	5101-22301934	RES, SEMI FIX 22K
686	VR102	5101-50201934	RES, SEMI FIX 5K
608	VR601	5101-10401934	RES, SEMI FIX 100K
608	VR602	5101-10401934	RES, SEMI FIX 100K
		MISCELLANEOUS	
832	CN103	4443-040185	CONNECTOR, 4 PIN
833	CN201	4443-05501029	CONNECTOR, 29 PIN
851	⚠ F1	5732-01601121	FUSE, T125mA/T125mAL 250V I IB
849	⚠ HF1	4472-04901	FUSE HOLDER, F1 I IB
849	⚠ HF2	4472-04901	FUSE HOLDER, F1 I IB
828	⚠ J301	4489-04003002	MLT PIN JACK, OUTPUT LEFT/RIGHT
829	⚠ J801	4481-00501	1P PIN JACK, DIGITAL OUT
830	J901	4451-00184	1P PIN JACK, REMOTE IN
830	J902	4451-00184	1P PIN JACK, REMOTE OUT
841	JL101	4242-R0107181	JUMPER LEAD
835	LCN113	4163-S5305121	CONNECTOR W/W
837	LCN114	4163-01526008	CONNECTOR W/W
838	LCN115	4163-01527008	CONNECTOR W/W
836	LCN117	4163-S5306800	CONNECTOR W/W
847	LUG1	4211-4	LUG, C15
847	LUG2	4211-4	LUG, W-1
848	LUG3	4211-4	LUG, W-3
848	LUG4	4211-4	LUG, W-3
781	PH901	5624-PC817	PHOTO COUPLR
647	RC250	5212-S0305103	R COMPOSITE, 10K X5
844	⚠ TM1	4214-245	TERMINAL, AC CORD
844	⚠ TM2	4214-245	TERMINAL, AC CORD
530	TP1	4214-132	TERMINAL, TEST PIN
722	TP101	4214-132	TERMINAL, TEST PIN
722	TP102	4214-132	TERMINAL, TEST PIN
722	TP103	4214-132	TERMINAL, TEST PIN
722	TP104	4214-132	TERMINAL, TEST PIN
646	TP201	4214-132	TERMINAL, TEST PIN
646	TP202	4214-132	TERMINAL, TEST PIN
646	TP203	4214-132	TERMINAL, TEST PIN
568	TP301	4214-132	TERMINAL, TEST PIN
817	TP801	4214-132	TERMINAL, TEST PIN
831	W801	4141-00158251	1C SHIELD WIRE
625	X201	5691-S1702852	XTAL, OSC, 8.4672MHz

PCB-2 FRONT P.C. BOARD

		CAPACITORS	
732	C401	5345-106C0951	CAP, MINI ELE 10U/16V
733	C402	5354-104J1HM	CAP, MYL .1U
746	C403	5345-106F0962	CAP, MINI ELE 10U/50V
747	C404	5345-107B0962	CAP, MINI ELE 100U/10V
748	C405	5354-471J1HM	CAP, MYL 470P
748	C406	5354-471J1HM	CAP, MYL 470P
733	C407	5354-104J1HM	CAP, MYL .1U
733	C408	5354-104J1HM	CAP, MYL .1U
		RESISTORS	
735	R401	5135-220J50P	RES, CBN 1/2P 22
751	R402	5134-102J25P	RES, CBN 1/4P 1K
750	R403	5134-100J25P	RES, CBN 1/4P 10
752	R404	5134-103J25P	RES, CBN 1/4P 10K
752	R405	5134-103J25P	RES, CBN 1/4P 10K
752	R406	5134-103J25P	RES, CBN 1/4P 10K
752	R407	5134-103J25P	RES, CBN 1/4P 10K
749	R408	5135-220J50P	RES, CBN 1/2P 22
753	R409	5134-221J25P	RES, CBN 1/4P 220
		INTEGRATED CIRCUIT	
730	IC401	5654-M957-243	IC, DIGITAL
		DIODES	
745	D401	5636-1S2473	DIODE, SWITCH
745	D402	5636-1S2473	DIODE, SWITCH
745	D403	5636-1S2473	DIODE, SWITCH
745	D404	5636-1S2473	DIODE, SWITCH
745	D405	5636-1S2473	DIODE, SWITCH
745	D406	5636-1S2473	DIODE, SWITCH
745	D407	5636-1S2473	DIODE, SWITCH
745	D408	5636-1S2473	DIODE, SWITCH
		MISCELLANEOUS	
834	CN401	4443-05401029	CONNECTOR, 29 PIN
741	FL401	5722-062	TUBE DISPLAY
742	RCV401	6143-00802	RECEIVER UNIT
743	SW401	4437-01201	SWITCH, PU-TC, OPEN/CLOSE
743	SW402	4437-01201	SWITCH, PU-TC, PLAY
743	SW403	4437-01201	SWITCH, PU-TC, PAUSE
743	SW404	4437-01201	SWITCH, PU-TC, STOP
743	SW405	4437-01201	SWITCH, PU-TC, R.SKIP
743	SW406	4437-01201	SWITCH, PU-TC, F.SKIP
743	SW407	4437-01201	SWITCH, PU-TC, R.SERACH
743	SW408	4437-01201	SWITCH, PU-TC, F.SERACH
744	SW409	4437-01202	SWITCH, PU-TC, DISPLAY
744	SW410	4437-01202	SWITCH, PU-TC, TIME
743	SW411	4437-01201	SWITCH, PU-TC, REPEAT
744	SW412	4437-01202	SWITCH, PU-TC, PROGRAM
839	W401	4163-0122020	CONNECTOR W/W

PCB-3 POWER SWITCH P.C. BOARD

		MISCELLANEOUS	
840	JL103	4242-R0504451	JUMPER LEAD
827	⚠ SW1	4431-S2202102	PUSH SWITCH, POWER
160		2240-Z042	HOLDER, JL103

Ser. No.	Ref. No.	Part No.	Description
CHASSIS MISCELLANEOUS			
		MISCELLANEOUS	
842	JL401	4242-S0329161	JUMPER LEAD
823A	⚠ P1	4161-03601202	CORD W/PLUG, AC CORD (BK)
823	⚠ P1	4161-03701220	CORD W/PLUG, AC CORD (I) (IB)
PACKING PARTS LIST			
021A		1119-05301	ATTACH SHEET, UL SAFETY (BK)
022A		1113-02501	OWNER CARD, REPLY CARD (BK)
023A		1119-04502	ATTACH SHEET, SERVICE SHOP GUIDE (BK)
024A		1116-03802	GUARANTY CARD, WARRANTY (BK)
030B		1756-23601	LABEL, CHAMPAGNE (I)
105A		1111-1200M152	OWNER GUIDE, IB (BK)
105		1111-1430M152	OWNER GUIDE, IB (I) (IB)
114		1221-31804	CARTON BOX
115		1222-7394	CUSHION, R
116		1222-7393	CUSHION, L
117		1223-R0420055	SOFT SHEET, FRONT
118		1223-00207018	SOFT SHEET, CD LID
119		1241-R0160601	POLYETHY BAG, SET
120		1241-R0123351	POLYETHY BAG, IB
145		1756-03108	LABEL, (I) LABEL, CARTON BOX (X2) (I) (IB)
825		4161-71184	CORD W/PLUG, RCA CORD
845		1135-00301	ACCESSORY BAT
846		6142-07802	REMOTE CONTROL ASS'Y

ABBREVIATIONS IN PARTS LIST

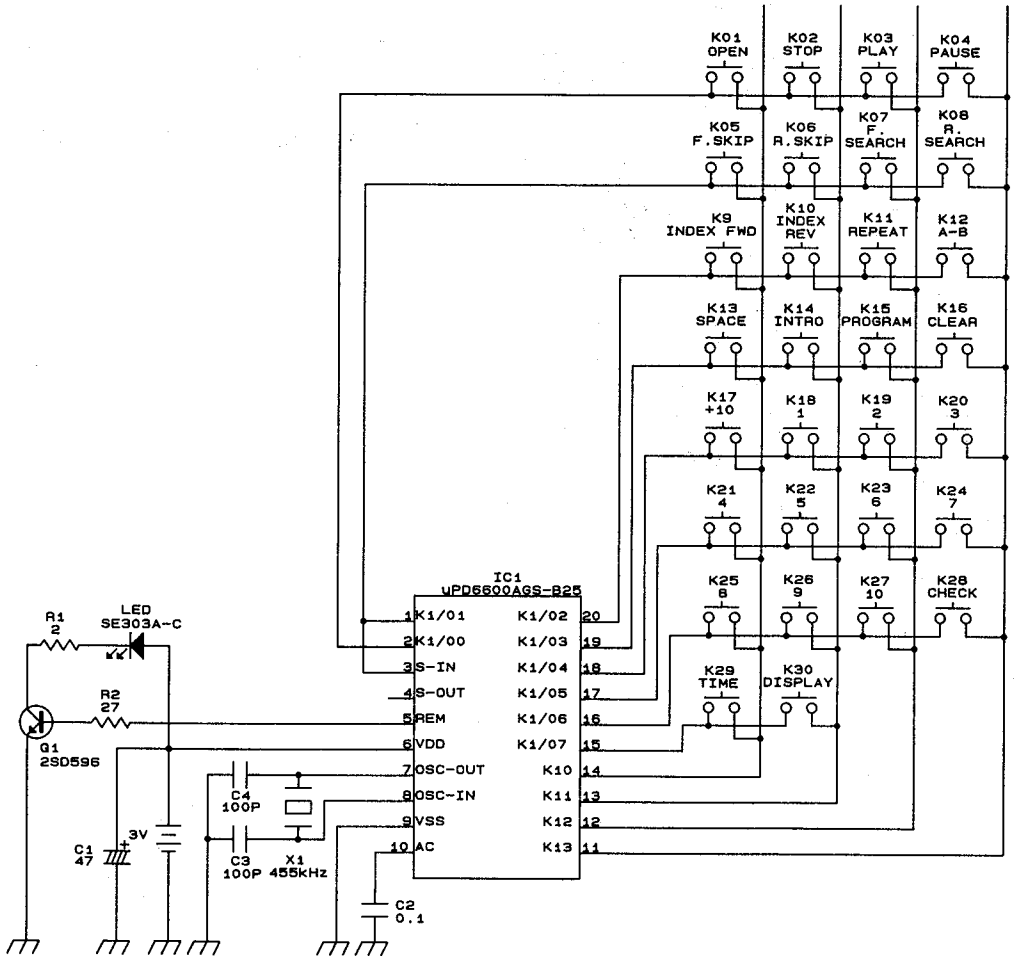
CAPACITORS		**RESISTORS**	
CAP, MINI ELE	: Electronic	RES, CBN 1/6P	: Carbon 1/6W
CAP, CER	: Ceramic	RES, FUSE	: Fuse
CAP, PPP	: Polypropylene	RES, CEM 5P	: Cement 5W
CAP, MYL	: Mylar	RES, MTL 1P	: Metal 1W
CAP, MCA	: Mica	2.2k	: 2.2kΩ
CAP, MINI BP	: Bipolar	220	: 220Ω
CAP, ELE BP	: Electrolytic Bipolar	**TRANSISTORS**	
470μ	: 470μF	XISTOR	: Transistor
6800p	: 6800pF	FET	: Field Effect Transistor
.047μ	: 0.047μF	**CONTROLS**	
		RES, SEMI FIX	: Semi-fixed Resistor

NOTE

⚠ **SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.**

SCHEMATIC DIAGRAM

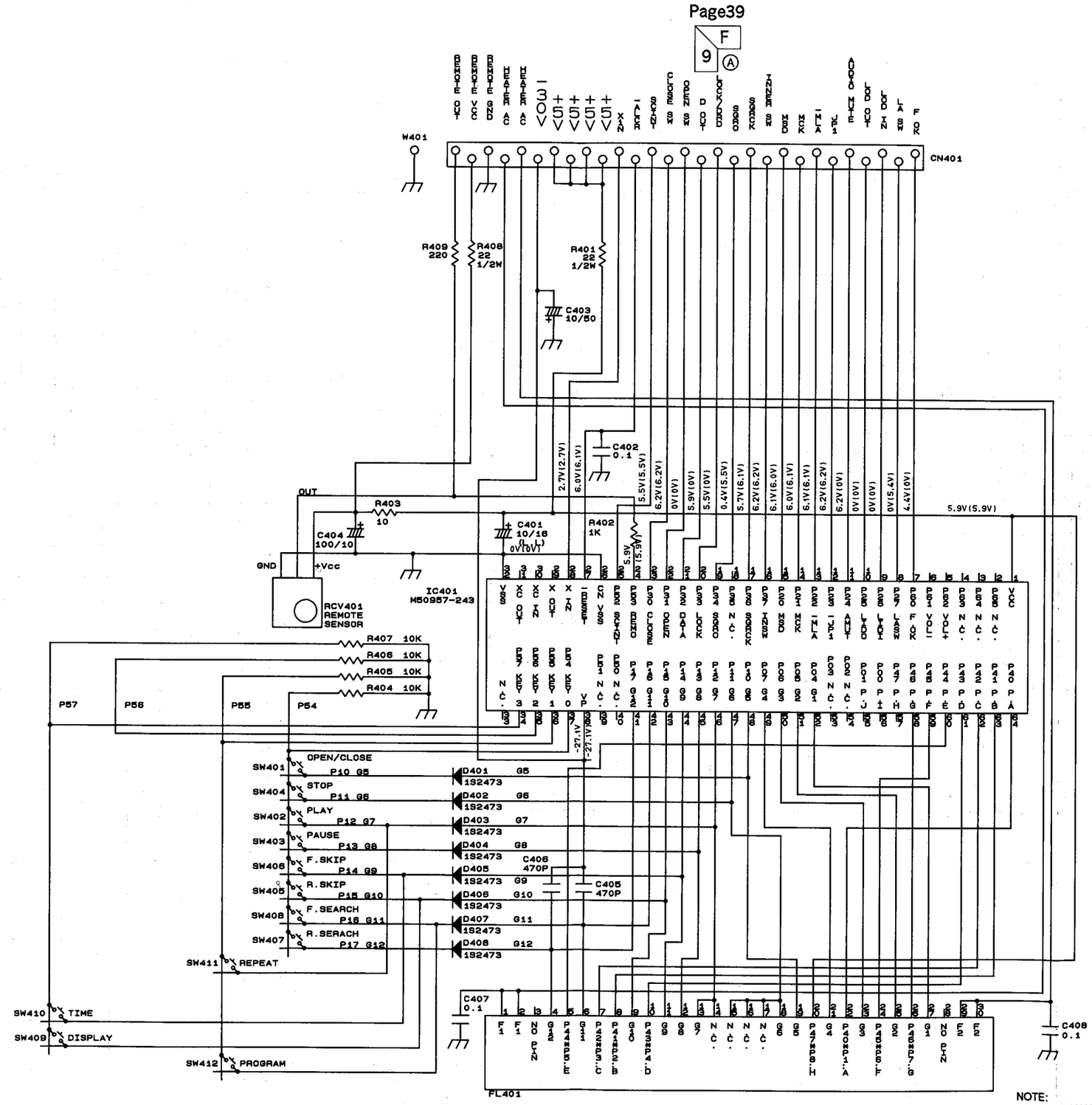
INFRARED REMOTE CONTROL



NOTE : Infrared Remote Control parts not available.
Schematic diagram supplied for reference only.

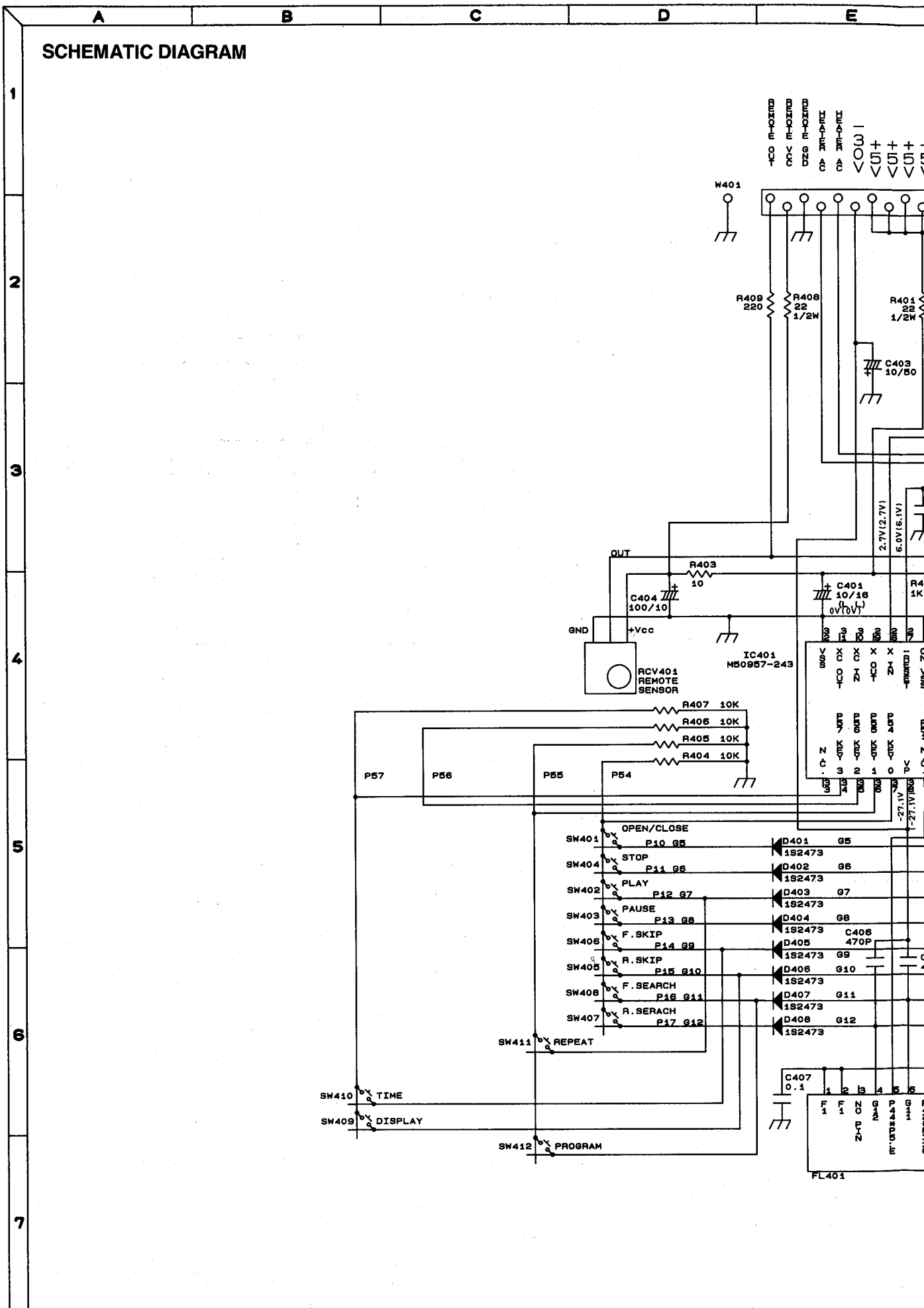
SCHEMATIC DIAGRAM

Page39
9 F A



NOTE:
1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. ALL CAPACITANCES VALUE ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
3. . . . V : DC VOLTAGE AT PLAY MODE.
   (. . . V) : DC VOLTAGE AT STOP MODE.
4. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

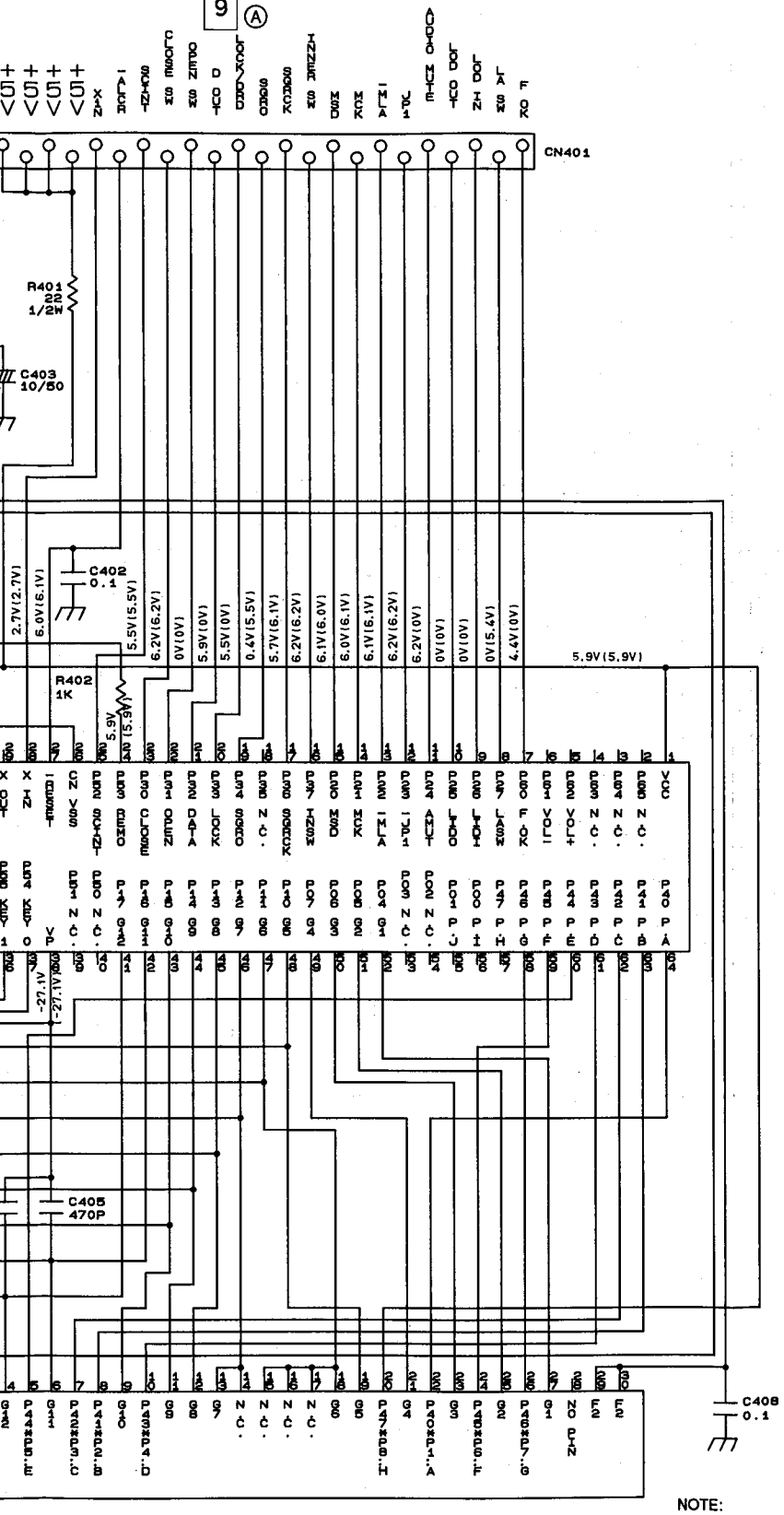
SCHEMATIC DIAGRAM



F G H I J

Page39

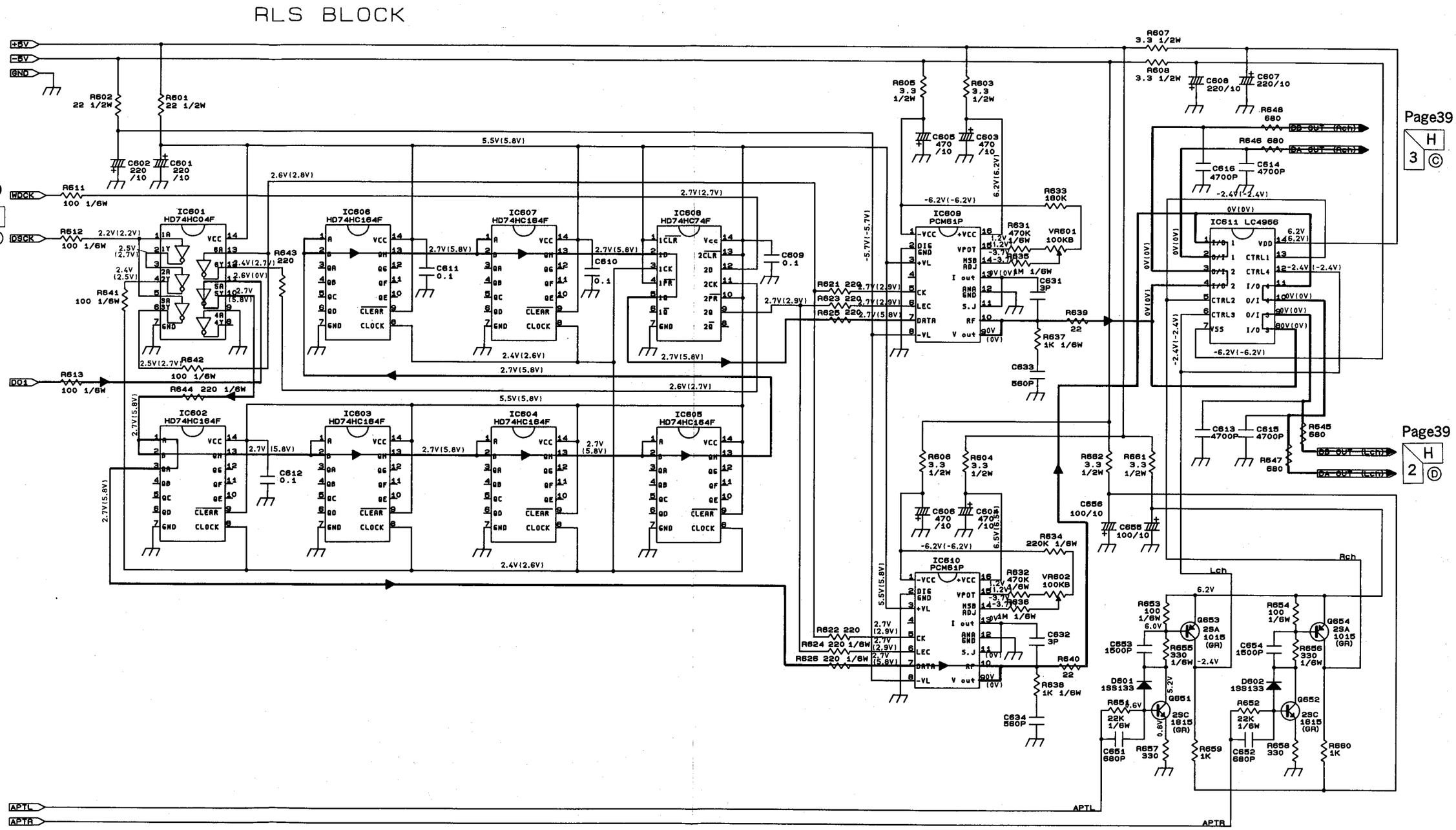
F 9 Ⓐ

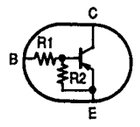


NOTE:
1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. ALL CAPACITANCES VALUE ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
3. . . . V : DC VOLTAGE AT PLAY MODE.
   (. . . V): DC VOLTAGE AT STOP MODE.
4. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM

RLS BLOCK



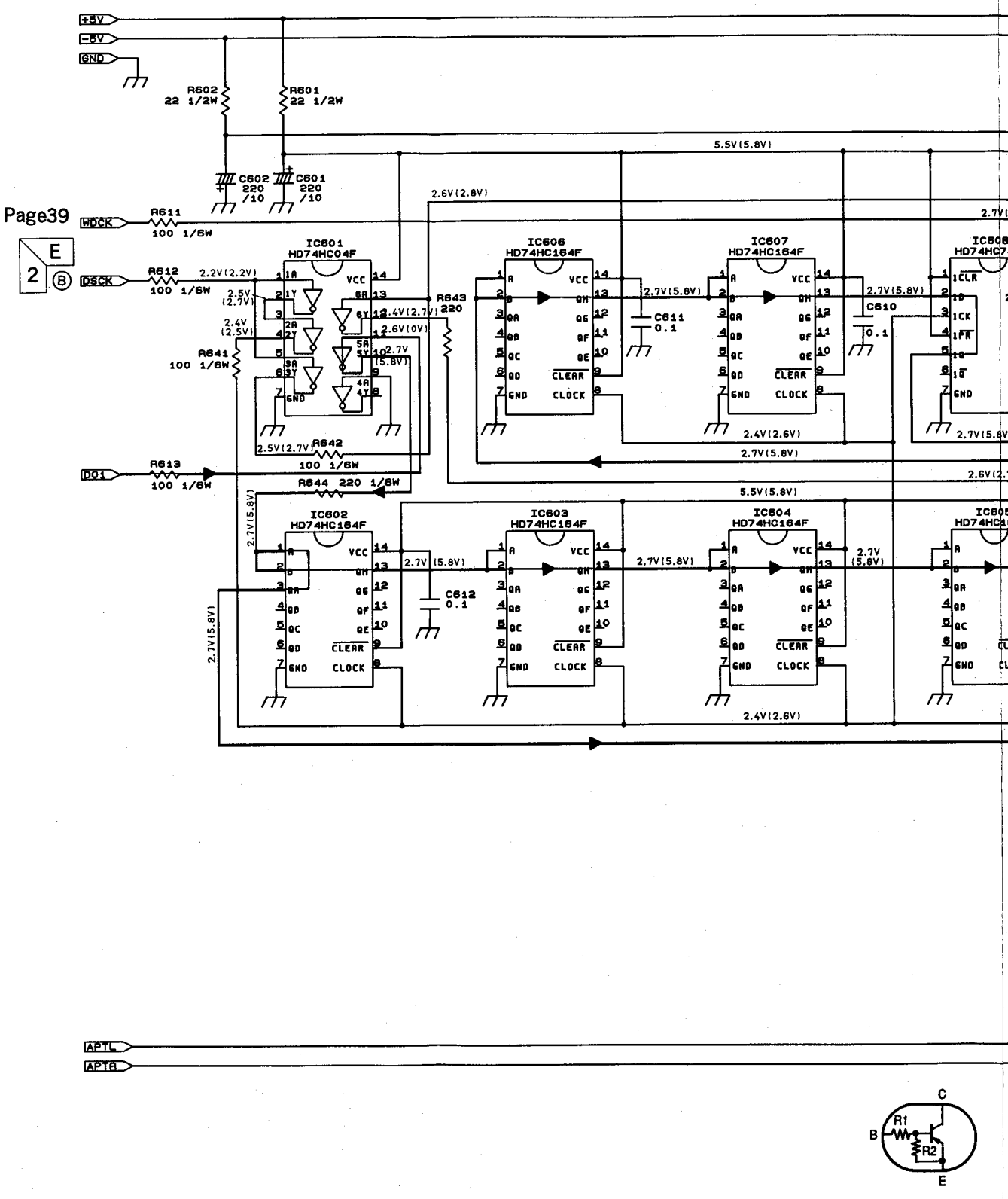


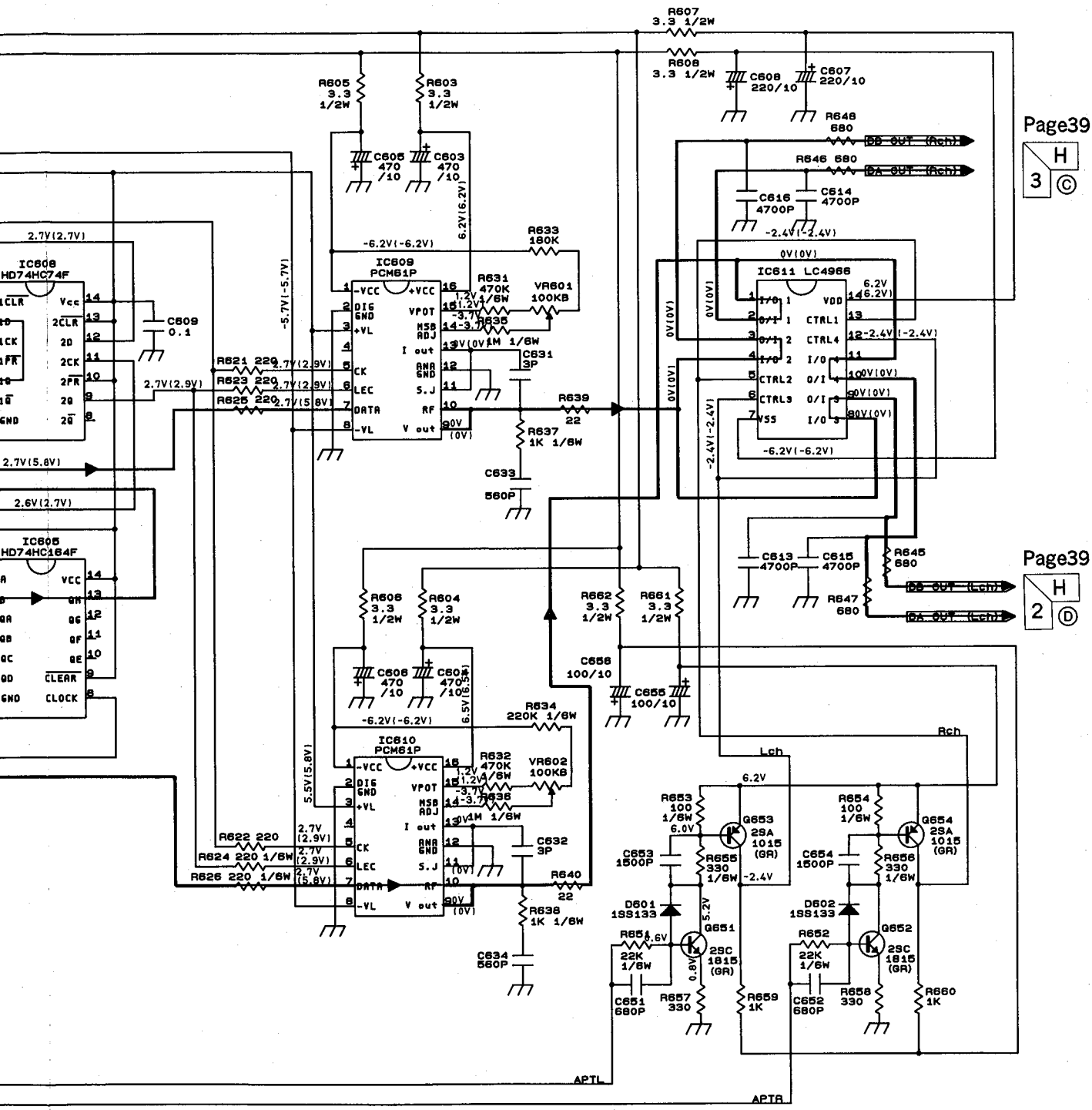
Type	R1	R2
DTA143ES	4.7k	4.7k
DTA114ES	10k	10k

NOTE:
1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. ALL CAPACITANCES VALUE ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
3. . . . V : DC VOLTAGE AT PLAY MODE.
   (. . . V) : DC VOLTAGE AT STOP MODE.
4. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM

RLS BLOCK

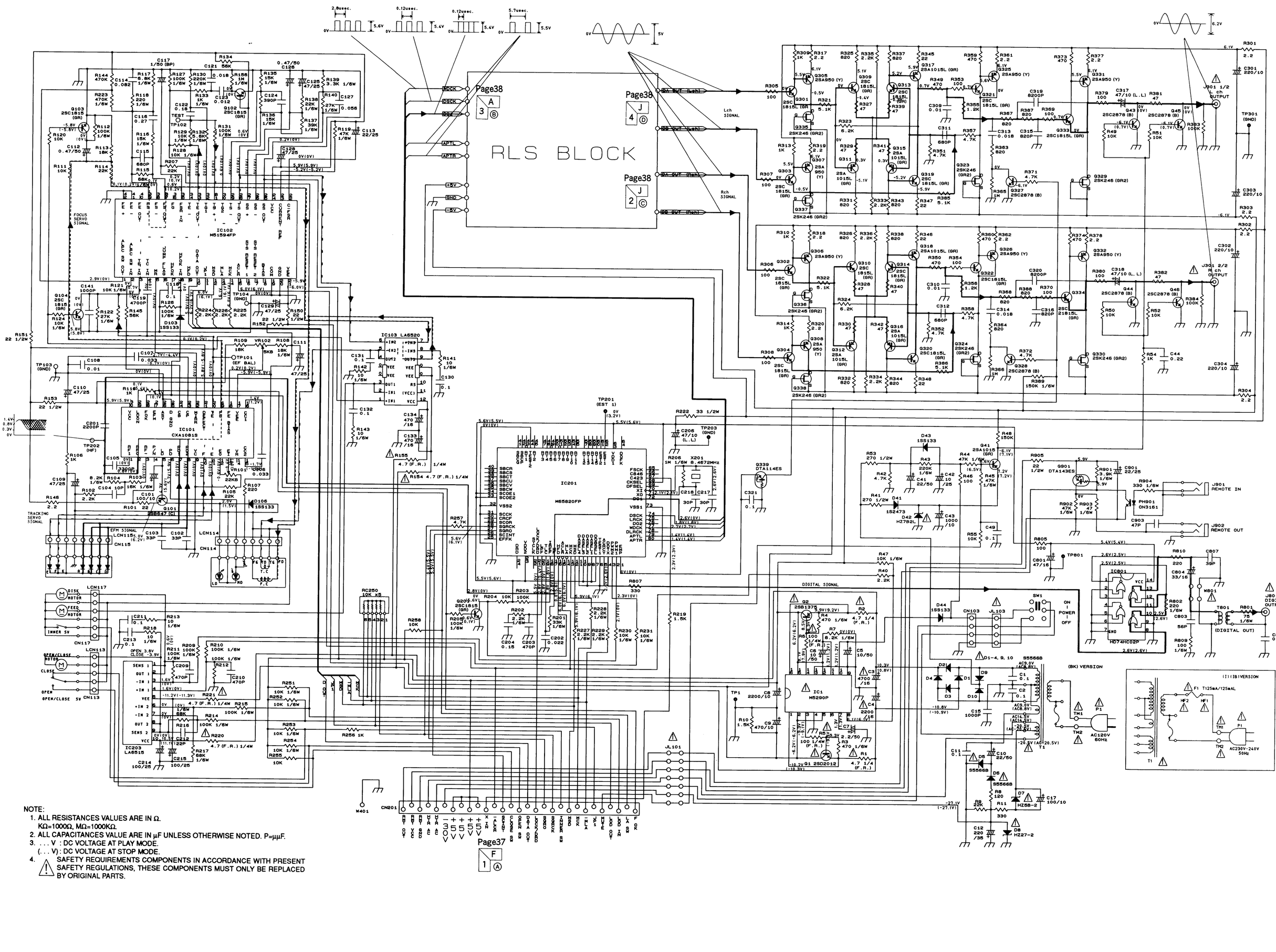




Type	R1	R2
DTA143ES	4.7k	4.7k
DTA114ES	10k	10k

NOTE:
1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. ALL CAPACITANCES VALUE ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
3. . . . V : DC VOLTAGE AT PLAY MODE.
   (. . . V) : DC VOLTAGE AT STOP MODE.
4. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

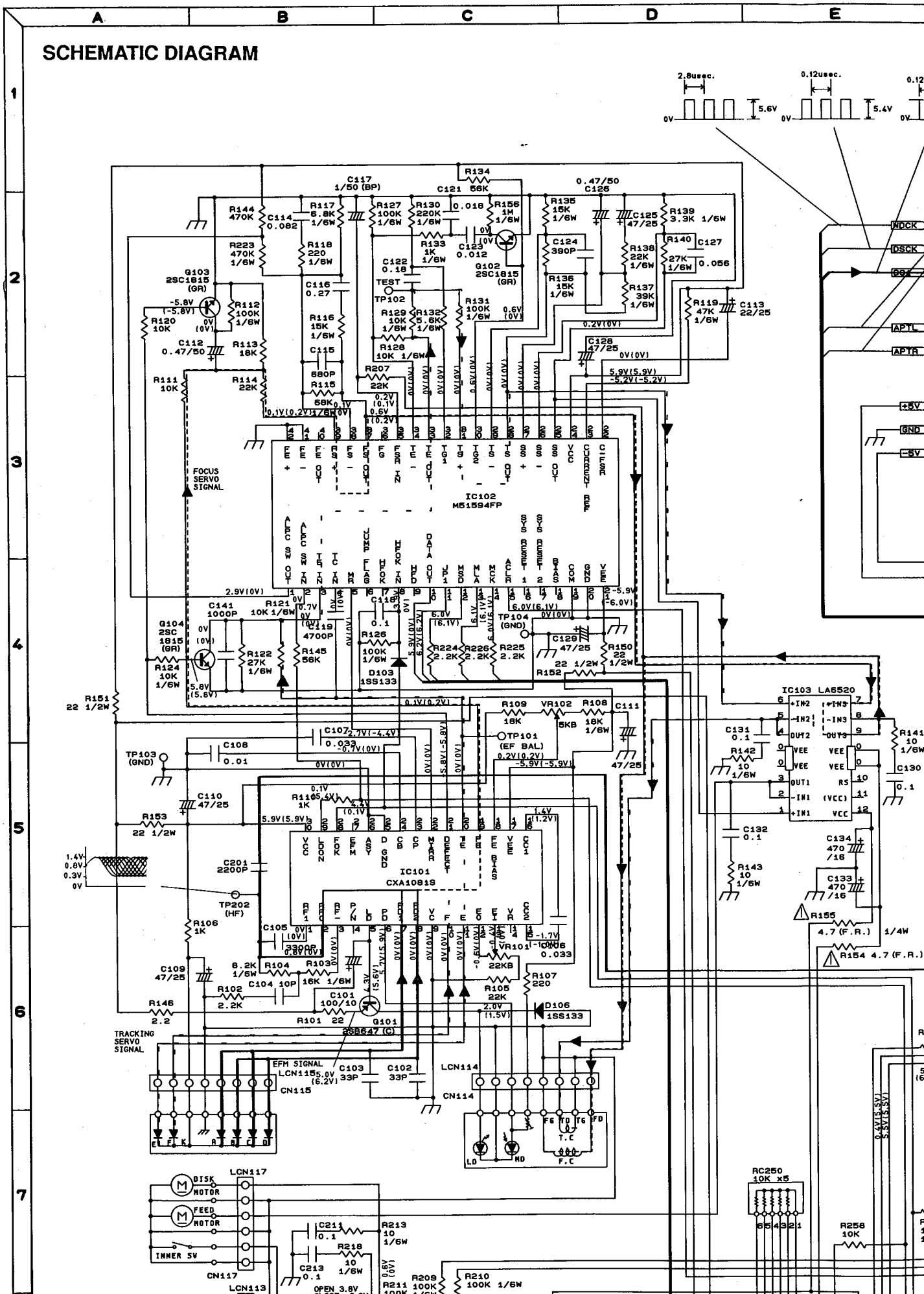
SCHEMATIC DIAGRAM

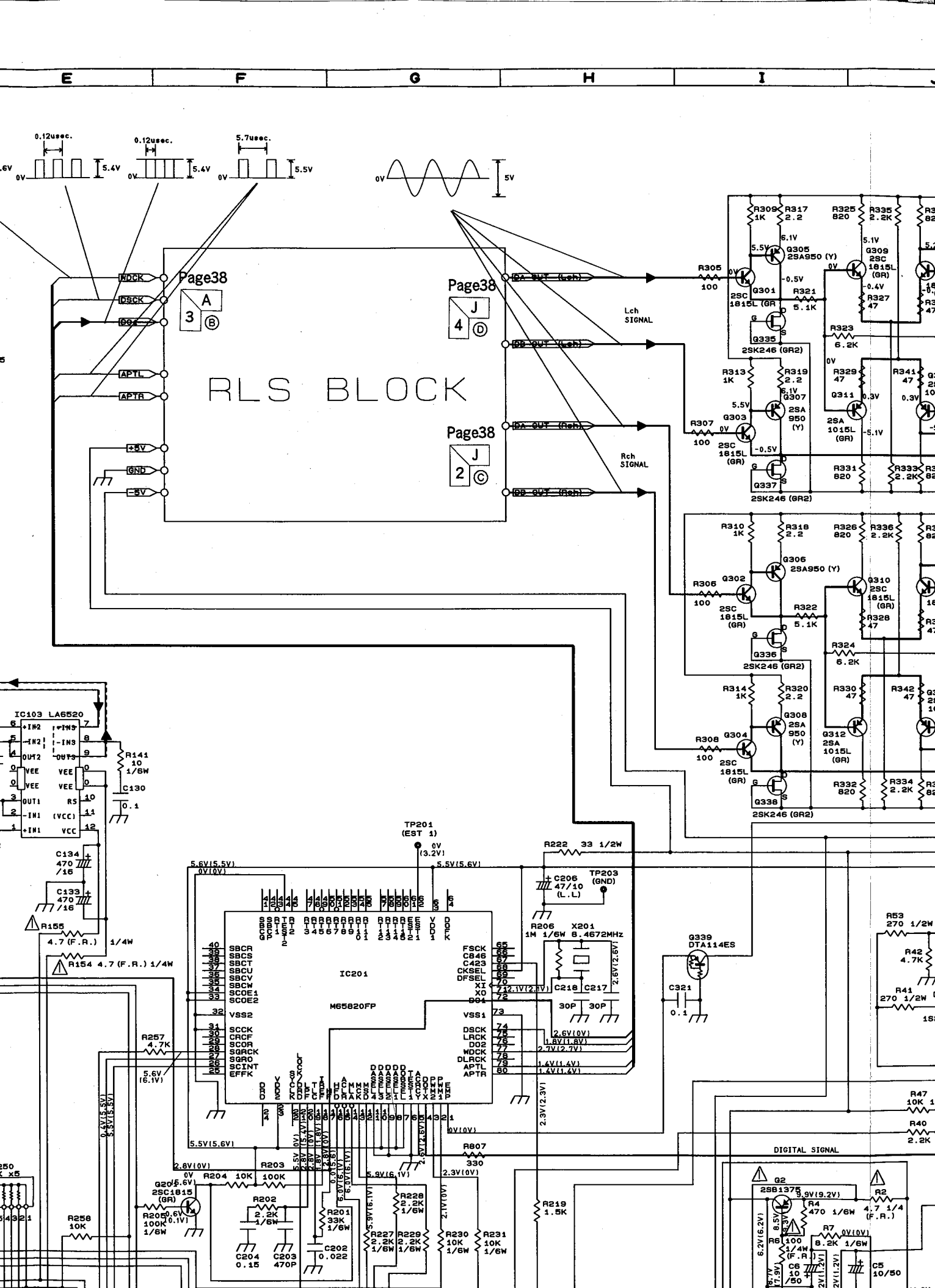


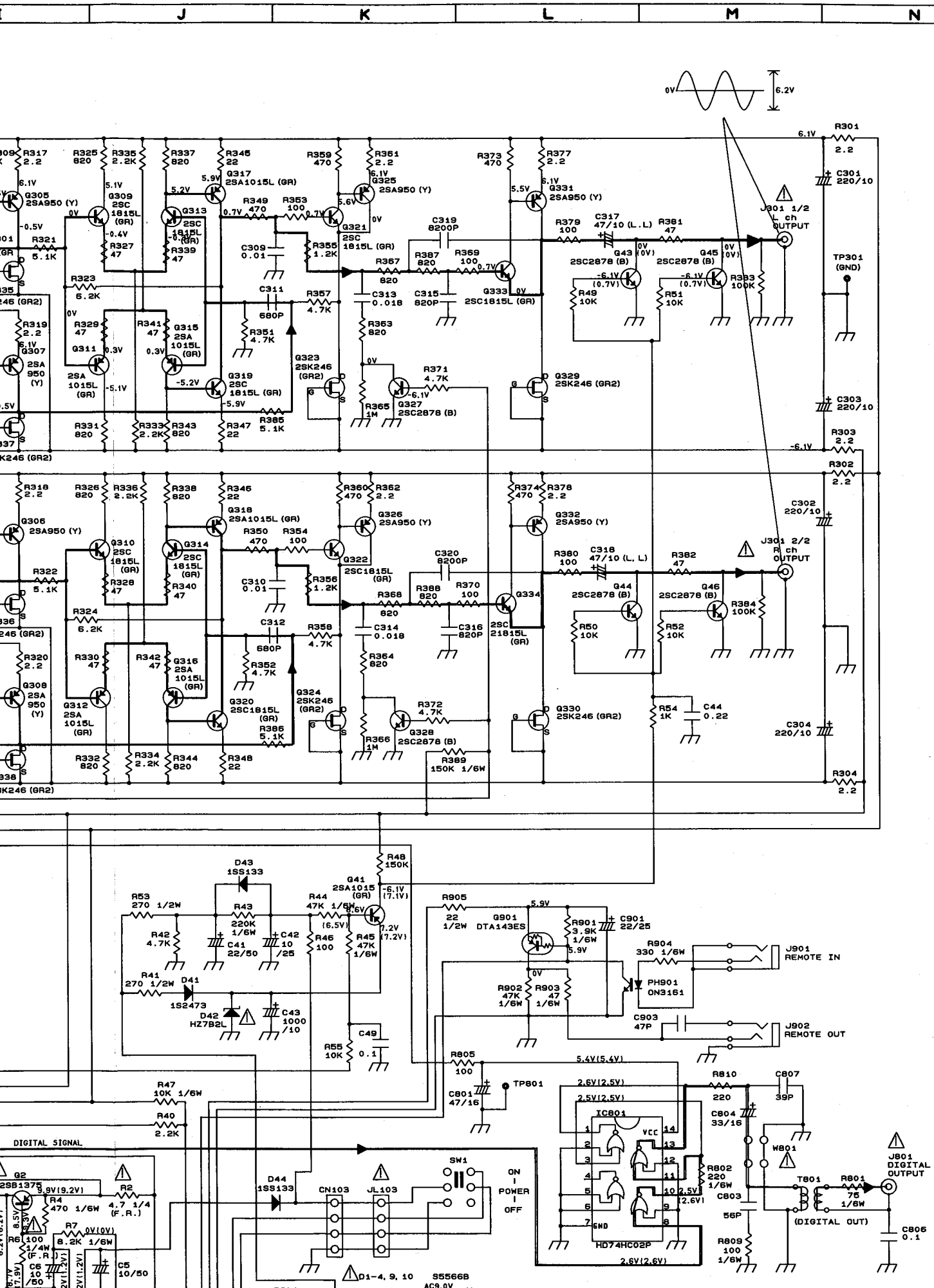
NOTE:

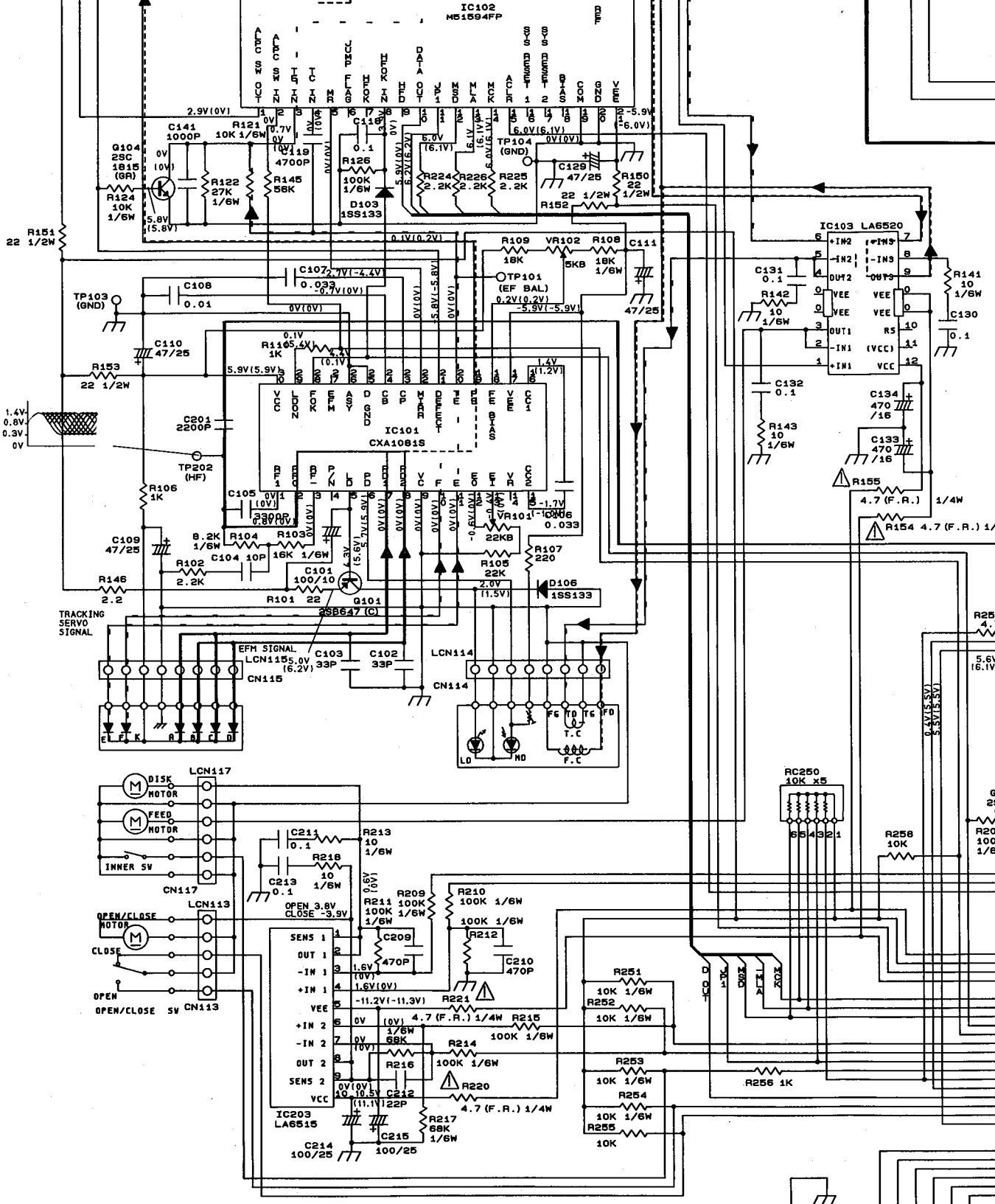
1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. ALL CAPACITANCES VALUE ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
3. . . . V : DC VOLTAGE AT PLAY MODE.
   (. . . V) : DC VOLTAGE AT STOP MODE.
4. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM



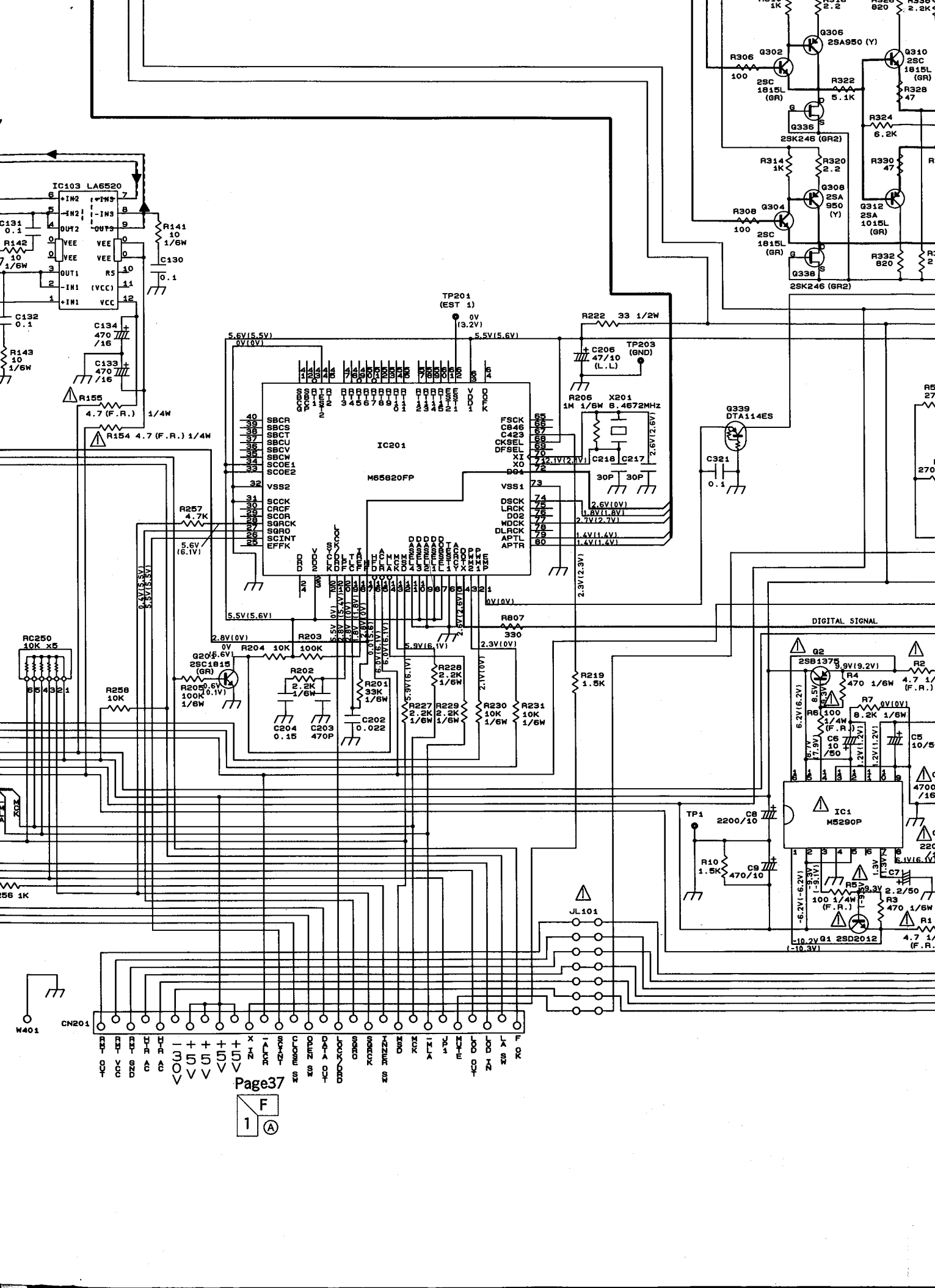

RLS BLOCK
Page38 A 3 B
Page38 J 4 D
Page38 J 2 C
Lch SIGNAL
Rch SIGNAL
DIGITAL SIGNAL
IC103 LA6520
IC201
M65820FP
X201 8.4672MHz
Q339 DTA114ES
Q2 2SB1375
2SK246 (GR2)

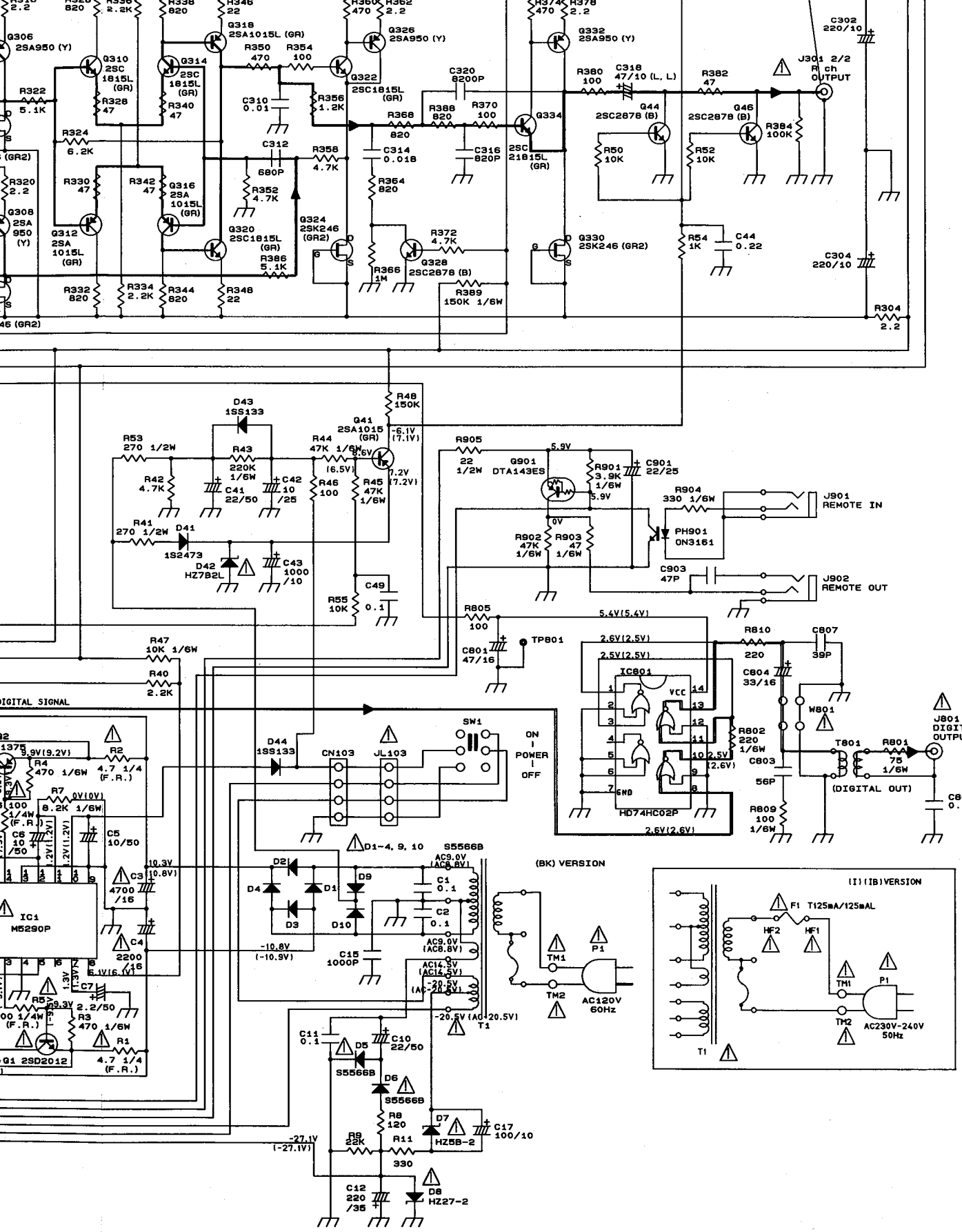

I
J
K
L
M
N
0V
6.2V
R301
2.2
C301
220/10
J301 1/2
L ch
OUTPUT
TP301
(GND)
C303
220/10
R303
2.2
R302
2.2
C302
220/10
J301 2/2
R ch
OUTPUT
C304
220/10
R304
2.2
R317 2.2
R325 820
R335 2.2K
R337 820
R345 22
R359 470
R361 2.2
R373 470
R377 2.2
Q305 2SA950 (Y)
Q309 2SC 1815L (GR)
Q313 2SC 1815L (GR)
Q317 2SA1015L (GR)
Q325 2SA950 (Y)
Q331 2SA950 (Y)
R321 5.1K
R327 47
R339 47
R349 470
R353 100
C309 0.01
R355 1.2K
Q321 2SC 1815L (GR)
C319 8200P
R379 100
C317 47/10 (L.L)
R381 47
R323 5.2K
R367 820
R387 820
R369 100
Q43 2SC2878 (B)
Q45 2SC2878 (B)
R49 10K
R51 10K
R383 100K
C311 680P
R357 4.7K
C313 0.018
C315 820P
Q333 2SC1815L (GR)
R363 820
R319 2.2
Q307 2SA 950 (Y)
R329 47
Q311 2SA 1015L (GR)
R341 47
Q315 2SA 1015L (GR)
R351 4.7K
Q323 2SK246 (GR2)
R371 4.7K
R365 1M
Q327 2SC2878 (B)
Q329 2SK246 (GR2)
R385 5.1K
Q319 2SC 1815L (GR)
R331 820
R333 2.2K
R343 820
R347 22
R318 2.2
R326 820
R336 2.2K
R338 820
R346 22
R360 470
R362 2.2
R374 470
R378 2.2
Q306 2SA950 (Y)
Q310 2SC 1815L (GR)
Q314 2SC 1815L (GR)
Q318 2SA1015L (GR)
Q326 2SA950 (Y)
Q332 2SA950 (Y)
R322 5.1K
R328 47
R340 47
R350 470
R354 100
C310 0.01
R356 1.2K
Q322 2SC1815L (GR)
C320 8200P
R380 100
C318 47/10 (L, L)
R382 47
R324 6.2K
R368 820
R388 820
R370 100
Q44 2SC2878 (B)
Q46 2SC2878 (B)
R50 10K
R52 10K
R384 100K
C312 680P
R358 4.7K
C314 0.018
C316 820P
Q334 2SC 21815L (GR)
R364 820
R330 47
Q312 2SA 1015L (GR)
R342 47
Q316 2SA 1015L (GR)
R352 4.7K
Q320 2SC1815L (GR)
Q324 2SK246 (GR2)
R372 4.7K
R366 1M
Q328 2SC2878 (B)
Q330 2SK246 (GR2)
R54 1K
C44 0.22
R386 5.1K
R332 820
R334 2.2K
R344 820
R348 22
R389 150K 1/6W
R48 150K
D43 1SS133
Q41 2SA1015 (GR)
R53 270 1/2W
R43 220K 1/6W
R44 47K 1/6W
R905 22 1/2W
Q901 DTA143ES
R901 3.9K 1/6W
C901 22/25
R42 4.7K
C41 22/50
C42 10 /25
R45 47K 1/6W
R46 100
R904 330 1/6W
J901 REMOTE IN
R902 47K 1/6W
R903 47 1/6W
PH901 ON3161
R41 270 1/2W
D41 1S2473
D42 HZ7B2L
C43 1000 /10
C903 47P
J902 REMOTE OUT
C49 0.1
R55 10K
R805 100
C801 47/16
TP801
R47 10K 1/6W
R40 2.2K
R810 220
C807 39P
C804 33/16
IC801
HD74HC02P
W801
J801 DIGITAL OUTPUT
T801
R801 75 1/6W
(DIGITAL OUT)
C806 0.1
R802 220 1/6W
C803 56P
R809 100 1/6W
DIGITAL SIGNAL
Q2 2SB1375
R2 4.7 1/4 (F.R.)
R4 470 1/6W
R7 8.2K 1/6W
R6 100 1/4W (F.R.)
C6 10 /50
C5 10/50
D44 1SS133
CN103
JL103
SW1
ON
POWER
OFF
D1-4, 9, 10 S5566B
AC9.0V



NOTE:

1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. ALL CAPACITANCES VALUE ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
3. . . . V : DC VOLTAGE AT PLAY MODE.
   (. . . V) : DC VOLTAGE AT STOP MODE.
4. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.


IC103 LA6520
IC201
M65820FP
IC1
M5290P
TP201 (EST 1)
TP203 (GND)
TP1
X201 8.4672MHz
JL101
CN201
W401
DIGITAL SIGNAL
Page37


Q306 2SA950 (Y)
Q310 2SC 1815L (GR)
Q314 2SC 1815L (GR)
R322 5.1K
R328 47
R340 47
R324 6.2K
R350 470
R354 100
Q318 2SA1015L (GR)
Q322 2SC1815L (GR)
R356 1.2K
C310 0.01
C312 680P
R358 4.7K
R352 4.7K
Q320 2SC1815L (GR)
R386 5.1K
Q324 2SK246 (GR2)
R366 1M
C314 0.018
R364 820
R368 820
C320 8200P
R388 820
R370 100
C316 820P
Q326 2SA950 (Y)
Q334 2SC 2181SL (GR)
R372 4.7K
Q328 2SC2878 (B)
R389 150K 1/6W
Q330 2SK246 (GR2)
Q332 2SA950 (Y)
R380 100
C318 47/10 (L, L)
R382 47
J301 2/2 R ch OUTPUT
C302 220/10
Q44 2SC2878 (B)
Q46 2SC2878 (B)
R50 10K
R52 10K
R384 100K
R54 1K
C44 0.22
C304 220/10
R304 2.2
R330 47
R342 47
Q316 2SA 1015L (GR)
Q312 2SA 1015L (GR)
R332 820
R334 2.2K
R344 820
R348 22
R320 2.2
Q308 2SA 950 (Y)
R338 820
R346 22
R360 470
R362 2.2
R374 470
R378 2.2
R48 150K
D43 1SS133
R53 270 1/2W
R43 220K 1/6W
R42 4.7K
C41 22/50
C42 10 /25
R44 47K 1/6W
R46 100
R45 47K 1/6W
Q41 2SA1015 (GR)
-6.1V (7.1V)
7.2V (7.2V)
R41 270 1/2W
D41 1S2473
D42 HZ7B2L
C43 1000 /10
C49 0.1
R55 10K
R905 22 1/2W
Q901 DTA143ES
5.9V
R901 3.9K 1/6W
C901 22/25
R902 47K 1/6W
R903 47 1/6W
0V
R904 330 1/6W
PH901 ON3161
J901 REMOTE IN
C903 47P
J902 REMOTE OUT
R805 100
C801 47/16
TP801
5.4V(5.4V)
2.6V(2.5V)
2.5V(2.5V)
IC801
HD74HC02P
2.6V(2.6V)
R810 220
C807 39P
C804 33/16
W801
R802 220 1/6W
C803 56P
R809 100 1/6W
T801
R801 75 1/6W
J801 DIGITAL OUTPUT
(DIGITAL OUT)
C806 0.1
R47 10K 1/6W
R40 2.2K
DIGITAL SIGNAL
SW1
ON
POWER
OFF
D44 1SS133
CN103
JL103
R2 4.7 1/4 (F.R.)
R4 470 1/6W
R7 8.2K 1/6W
C5 10/50
C6 10 /50
C3 4700 /16
C4 2200 /16
IC1 M5290P
C7 2.2/50
R5
R3 470 1/6W
R1 4.7 1/4 (F.R.)
Q1 2SD2012
D1-4, 9, 10 S5566B
D2
D4
D1
D3
D9
D10
C1 0.1
C2 0.1
C15 1000P
-10.8V (-10.9V)
AC9.0V (AC8.8V)
AC14.5V (AC14.5V)
-20.5V (AC-20.5V)
T1
(BK) VERSION
TM1
TM2
P1
AC120V 60Hz
(I)(IB)VERSION
F1 T125mA/125mAL
HF2
HF1
AC230V-240V 50Hz
C11 0.1
C10 22/50
D5
D6
S5566B
R8 120
D7 HZ5B-2
C17 100/10
-27.1V (-27.1V)
R9 22K
R11 330
C12 220 /35
D8 HZ27-2